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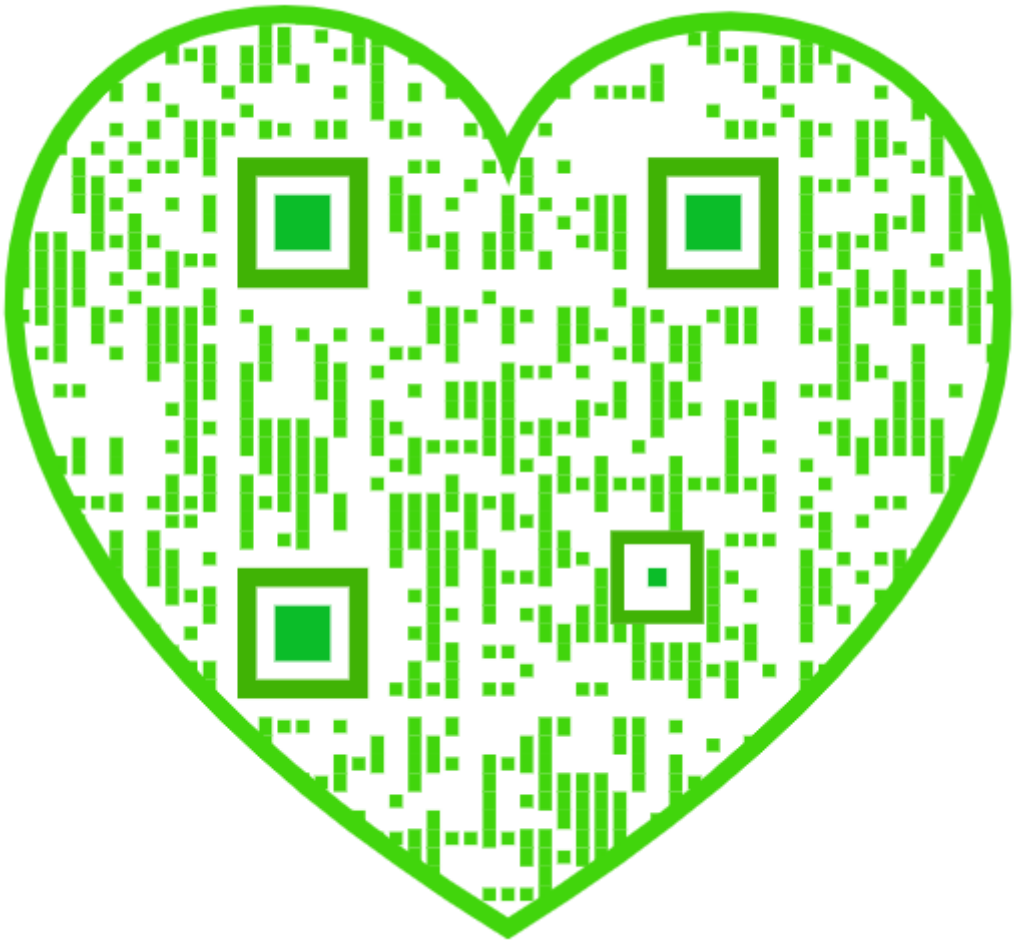

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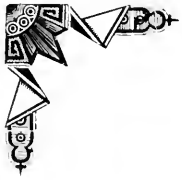

THE

# TOBACCO GROWERS' GUIDE,

A COMPILATION OF

HINTS, SUGGESTIONS AND EXPERIENCE OF THE MOST

PRACTICAL AND SUCCESSFUL

## Tobacco Growers,

BY F. W. COON.

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# THE TOBACCO GROWERS' GUIDE

## HISTORICAL.

Tobacco is grown in nearly every part of the world, yet it was known only to the Indians of North America prior to the landing of Columbus at the Island of Guanahani, October 12th, 1492, and it is easy to imagine the surprise of the Spaniards at seeing the savages blowing clouds of smoke from their noses and mouths. The Indians wrapped a dry herb in a corn leaf, lighted one end of the roll and imbibed the smoke from the other. Such a roll was called by them tobacco, while the herb itself was called kohoba. They gave the name of tobacco to the two pipes attached to a funnel, by means of which they inhaled through their noses the smoke of kohoba leaves placed upon burning coals. They used fresh leaves of the kohoba plants for healing wounds, and filled the tents in which sick persons were lying with tobacco smoke to lesson their pains and cure them. In the council of the tribes and Indian nations, in the assemblies of the warriors at the council house, and in later years in their parleys and treaties with the whites, the ceremony of smoking the pipe was of the first importance, and was the token of good faith. Passing the pipe around the circle of the assembly was the inductory ceremony of all the councils, whether for deliberation among themselves, or discussion and treaty with other tribes or with the whites. As a great discovery, Columbus took tobacco seed home with him, where at first the plant was deemed valuable for its medicinial properties, but the Spaniards soon began smoking it. Then it became popular and seed was sent to France, then Germany, and Italy, and soon became known among all civilized nations, and became famous as an approved remedy for all diseases. In Mexico, conquered in 1519, the Spaniards found tobacco in general use, and wherever they went they saw the people smoking it from reeds, mixing rose leaves and aromatic gums with the dry herb. The Mexicans also chewed and snuffed tobacco. In the American Colonies, tobacco soon became a very impor-

tant and popular crop, and much of it was shipped to the old countries. A farmer of Virginia has a bill of lading dated May 16, 1790, for the shipment of a lot of twelve hogsheads of tobacco from Rappahannock, Virginia, to Liverpool, England. All of the pioneers of Kentucky brought with them to the West, tobacco seed for the first planting; and in their expeditions against the Indian villages north-west of the Ohio they would find tobacco growing in the fields, and packed away in the wigwams and cabins.

CHEMICAL COMPOSITION.

Tobacco contains an alkaloid called nicotine, C-6 H-14 N-2, which, when pure, is a colorless liquid, sp. gr. 1.048 at 60 Fahr., boils at 482°, has an acrid odor and a burning taste; very soluble in water, fixed oils, alcohol and ether. It is rarely used, and is so liable to turn brown by oxidation that it is next to impossible to maintain it colorless for any length of time. It is peculiar as being one of the liquid volatile alkaloids. According to Dr. Murry, tobacco contains: Nicotine, 2 to 9 per cent.; nicotianine, 2 grains per lb.; a bitter extractive principle; fatty matter; tannin and gallic acid; a yellowish oil; gum mucilage; salts of lime, potash, magnesia, soda, ammonia, silicia and moisture. Tobacco leaves are remarkably rich in inorganic constituents, the proportions varying from 16 to 27 per cent. According to Boussingault they contain, when dry, about 1 per cent. of phosporic acid, and from 2 to 5 per cent. of potash, together with $2\frac{1}{2}$ to $4\frac{1}{2}$ per cent. of nitrogen, partly in the form of nitrate, so that to enable the plant to flourish it must have a rich soil or continual manuring. Tobacco smoke, when analyzed, consists of nicotine, resin, oil, ammonia, phenol, cresote, Co, Co-2 HCN, and H-2 S.

EFFECTS OF TOBACCO.

In his luminous "Treatise on Poisons" Dr. Christinson states that "no well-ascertained ill effects have been shown to result from the habitual practice of smoking." The research of Dr. Richardson, F. R. S., are of immense value with regard to the action of tobacco upon the health. He is of opinion there are no grounds for believing that smoking—of course, we infer, when indulged in with moderation—can produce organic change. Functional disturbances of the heart, brain and vision, he tells us, may be traced to its excessive use. In the course of an important discussion which took place between Sir Roland Martin, Mr. Solly, Dr. Ranking and other scientific physicians, the following important results were arrived at respecting smoking: 1. That the habit is predjudical when carried to excess. 2. That tobacco is innocuous when compared with alcohol, and in no case worse than tea, and by the side of high living contrasts most favorably. It is impossible to lay down any rule as to the amount of tobacco which may be consumed with delerious effect upon the health. What would be moderation to one is often excess to another, according to temperament, habit, and individual peculiarities. Each person ought to be able to judge for

himself as to what is moderation. The best time for smoking is undoubtedly after a meal; and the most injurious on an empty stomach.

ON SMOKING.

A peculiarity about tobacco is that its quality depends entirely upon the character of the ground which it grows. That grown on the western portion of the Island of Cuba is far superior to that grown in the eastern section. There is a marked difference in that raised on different plantations in the same section, and even on different parts of the same plantation. Havana seed planted in the Connecticut valley produces an entirely different quality, the leaf being remarkably thin and silky and almost devoid of the aroma peculiar to the Cuban product. In Virginia the seed produces a leaf so rich in nicotine that it is entirely unfit for cigars, but well adapted for chewing and smoking purposes. Maryland, Ohio and Kentucky each produce very different qualities, all of which find special uses. The Northern grown leaf makes the finest wrappers for cigars and is shipped in large quantities to Havana for that purpose. Cigars were not known until about 1815. Previous to that time pipes were used exclusively. Chewing had then been in vogue to a limited extent for some time, while snuffing dates back almost as far as smoking. The first package sent to Catharine de Medici was in fine powder. She found that smelling it in the box affected her similarly to smoking, which led her to fill one of her smelling bottles with the dust. Her courtiers adopted the habit of snuffing small portions of it up their nostrils, and as the precious stuff became more plentiful the snuffing habit became more general, until at last a man or woman was not considered as in proper form unless they snuffed. The custom become so common in England that a snuff box was no longer an ensignia of rank. Then it was the law prohibiting the culture of the plant, except for medicine was passed. About the same time a heavy tariff was placed on the imported article, thereby practically placing it beyond the reach of the common herd and giving royalty a complete monopoly. Since the first began to be used as a luxury there have been conflicting opinions in regard to its effects. The Romish Church once forbid its use and the Church of England declaimed against it. The Wesleys opposed it hotly, and at one time it was considered so unclean as to unfit men for membership in the Methodist Church. Baptist and Presbyterian ministers preached against it, and societies were organized to oppose the spread of the habit, but all to no purpose. Parents disowned and disinherited their children because they used it, and husbands divorced their wives on account of their having contracted the habit of smoking. It is singular that when women get into the habit of smoking a pipe they prefer a strong one. There are a few men who have nerve enough to smoke a pipe such as a woman likes when she has become a confirmed smoker. When they first begin puffing cigars they prefer them very mild, but it is not long until they want them black and strong and lots of them. The first chew or first cigar is always

remembered, for they almost invariably produce a sickness only paralleled by that of seasickness, and, like the latter, the victim is not at all frightened, but wants to die, or, at least, does not care whether he lives or not. As soon as the attack is over, however, he is ready to try it again. By patience and persistence the nauseating effects are overcome and the deathly sickness gives place to delightful sensations.

Spanish and Portugese ladies of all ranks smoke cigarettes—little cigars, not those vile paper things that pollute the air, but fine flavored little cigars. They are also used to a considerable extent in France, but the custom has never prevailed to any great extent either in England or America. The pipe is less popular among ladies in this country now than it was fifty years ago. In the Southern states, however, the women of the middle and lower classes nearly all smoke or rub snuff, and not a few do both. Storekeepers in many parts of tne South buy snuff by the barrel and keep it under the counter with the sugar and coffee.

On the other hand, smoking fouls the breath, injure the sense of taste, vitiates the atmosphere of a room and entails unnecessary expense. Chewing is more filthy than smoking but not so expensive. Physicians are not agreed as to which is the more harmful. The better way to learn the bad phases of the tobacco habit is to ask some female hater of the weed who possesses the faculty of expressing her mind freely. Her advice will be never to use it in any form, and if you do, quit it entirely, which advice is sound, and no one will ever regret heeding it.

A PLEA FOR THE SMOKER FROM A SANITARY POINT OF VIEW.

So much has been written upon the question of tobacco, pro and con, that any attempt to discover new and untrodden ground would almost seem a hopeless task, altogether beyond the range of the explorer. It has had its votaries inumerable, who have seen in it a universal panacea, competent to deal with all the ills suffering humanity is heir to, mental and physical, on the other hand, it had its opponents, those who, contrawise, have attributed to its use influences of no common or trifling order. In this, as in all such like cases involving great and important truths, the ultimate standpoint of appeal centres in the question of experience, and concerning which there is little need of citation in answer to the graver charge at the bar of public opinion; once there its record would, as on many previous occasions, attest to facts difficult of contraversion, facts too often in juxtaposition to argument unsupported except by hyposesis of the most flimsy character. It has occurred to us, however, that the search for new paths, or subject matter in connection with the problem, is not so hopeless as might on first sight appear, and in the exploration we have availed ourselves of some of the more recent investigations and discoveries of science, which have invested the route with many new points and passages of interest and which we would fain think will bear fruit of considerable importance. That tobacco smoke has played in the history of disinfectants

is an assertion by no means new, and the statement to that effect will take none of our readers by surprise, nevertheless, the assumption has had little or no solid resting ground as a basis and in support of such claims. It has been reversed for modern chemistry to establish the broad fact and to teach us that we are justified in regarding the products arising from the combustion of tobacco (in other words, tobacco smoke) as an actual and powerful antiseptic, and as such from its diffusive character, a simple and effective sanitary aid, more potent and real in dealing with "germs" than scores of nostrums and preparations advocated for such purposes. Our grounds are simply as follows: In the combustion of tobacco, and as brought about in the act of smoking, the products of decomposition envolved consist mainly of a series of powerful organic compounds known to chemists as the Pyridine Bases, or Alkaloids, conjointly with traces of Nicotine; to the latter compound has been attributed the entire narcotic properties of tobacco smoke in its physological action on the animal economy. Chemists, however, are now pretty well agreed that the action referred to is chiefly due to the presence of the basic substances named. And it becomes highly interesting to learn that in the case of pipe smoking the more highly volatile and intoxicating pyridine is evolved, whilst that of cigar smoking little pyridine, but more of the associated collidine, is formed and given off; but these facts are not the only ones springing from the study and investigation of the chemist; it has long been known that the so-called pyridine bases numbering nearly a dozen distinct compounds, and as already stated arising from the destructive distilation of tobacco, also exist in certain well-known coal-tar products and allied bodies, notably creosote. We need scarcely remind our readers that the latter substance has long enjoyed a world-wide reputation both as a disinfectant and antiseptic, and has found important application and uses in the technical arts; the efficacy of creosote has invariably been attributed to the presence of carbolic acid, but quite recently it has been demonstrated, and beyond much doubt, that the true antiseptic character of the fluid has been due far more to the contained alkaloidal bases than to carbolic acid; indeed, carefully compounded experiments have proved that these compounds occupy a position in the very foremost ranks of antiseptic, minute proportions of which completely sterilize substances prone to decomposition and the formation of "germs." So much for the broad facts and deductions of chemistry, and which, we venture to think, will not prove unproductive interest to the smoker. In the cloud arising from his favorite clay, and in the aroma of the "fragrant weed," he will discover more than a mere solace for his troubles and woes, or an hour passed in visions of dreamland; he will regard it as a charmed atmosphere, charged with elements of antiseptic value and within which he may enjoy comparative safety and immunity when in the presence of noxious emanations. Armed with the knowledge thus gained, may we not say he will find there are periods and times atten-

dant upon the daily walks of life in which his pipe may play the part not only of a friend indeed, but of a real friend in need?

### EXTENT OF TOBACCO PRODUCTION.

The following statistics show the production of tobacco in some of the leading states in the year 1880. Since that time there has been a large increase of production:

| | lbs |
|---|---|
| Kentucky | 171,120,840 |
| Virginia | 80,000,000 |
| Connecticut | 14,044,052 |
| Illinois | 3,935,825 |
| Indiana | 8,872,842 |
| Maryland | 26,000,000 |
| Massachusetts | 5,369,436 |
| New York | 6,481,431 |
| North Carolina | 26,986,213 |
| Ohio | 34,735,235 |
| Pennsylvania | 36,943,272 |
| Tennessee | 28,365,052 |
| West Virginia | 2,296,141 |
| Wisconsin | 10,008,423 |
| Missouri | 12,015,657 |

The tobacco of the Southern states is exported to a great extent. What is retained in the country is manufactured into fine cut and plug, used for smoking and chewing. The tobacco of the Northern states is mostly manufactured into cigars; a comparatively small amount of it is now exported. We more particularly represent the tobacco used for cigars. Previous to the year 1881 the domestic tobacco furnished all the wrapper leaf needed by our cigar manufacturers and was used almost exclusively to cover cigars. Only about one-half of an average crop of tobacco is fitted for wrappers and that grade alone can be produced at a profit by farmers.

### THE GROWTH OF THE TOBACCO INDUSTRY.

It is a well known fact that the soil and climate of the United States are peculiarly adapted to the successful growth and production of fine tobacco. It is therefore one of the leading productions of our agriculture in several of the most important states and is rapidly growing in prominence in several others. In tobacco production a great amount of labor is employed all through the year in its growth and preparation for market. Tobacco is grown to a greater or less extent in every state and it is a crop largely growing in importance in fifteen of the most populous states of the Union, as one of the chief money crops of the farmers upon which they depend for a living. With the expectation of its continued successful production, farmers have invested millions of dollars in buildings for curing tobacco, warehouses, sorting rooms and appliances to fit the crop for market; these would be mostly useless for any other farm purpose. While its production has been kept up, the value of farm lands and other property has been greatly enhanced.

In the amount of tobacco grown in Wisconsin stands second in the list of cigar leaf growing states, being led only by Pennsylvania, and with the natural increase of the past five years for the coming five, the Badger State promises to rank first in the list. The increase of this industry in the past ten years will prove interesting statistics. The following figures are taken from the reports of the county clerks to the secretary of state, as required by law each year:

| | Acres. |
|---|---|
| 1874 | 1,444 |
| 1875 | 4,399½ |
| 1876 | 3,296 |
| 1877 | 4,842 |
| 1878 | 4,652 |
| 1879 | 7,440 |
| 1880 | 13,359 |
| 1881 | 12,588 |
| 1882 | 14,924 |
| 1883 | 12,307 |
| 1884 | 15,836 |

Thus in ten years the acreage of this crop has increased from 1,444 acres to 15,836 acres. Tobacco is now grown in thirty counties, the following table gives the amount in each, as shown by the records in the office of the secretary of state:

TOBACCO GROWING IN 1884.

| | Acres. |
|---|---|
| Adams | 2 |
| Brown | 2 |
| Columbia | 104 |
| Crawford | 10 |
| Dane | 7,585 |
| Dodge | 14 |
| Fond du Lac | 1 |
| Grant | 37 |
| Green | 194 |
| Green Lake | 3 |
| Iowa | 6 |
| Jackson | 5 |
| Jefferson | 458 |
| La Crosse | 2 |
| La Fayette | 4 |
| Manitowoc | 13 |
| Marathon | 4 |
| Marquette | 14 |
| Milwaukee | 30 |
| Oconto | 2 |
| Pierce | 2 |
| Richland | 17 |
| Rock | 7,084 |
| Sauk | 18 |
| Shawano | 1 |
| Vernon | 136 |
| Walworth | 42 |
| Waukesha | 6 |
| Waushara | 2 |
| Winnebago | 38 |
| Total | 15,836 |

TOBACCO GROWING IN WISCONSIN.

The name of Pomeroy is intimately connected with the history of

tobacco growing in the West. In the year 1838 Thomas and Ralph Pomeroy raised the first crop of Connecticut seed leaf every grown in Wayne township, in the Miami valley, Ohio. About twelve years later the two brothers, Ralph and Orrin, and a cousin, Chester Pomeroy, journeyed across the country by wagon to Rock county, Wisconsin, taking the Connecticut seed with them. They settled upon a beautiful prairie two miles south of Edgerton, where two of the brothers still reside. Ralph Pomeroy grew his first crop of Wisconsin tobacco on rented land on the prairie near Syene, Dane county, in 1854. The next season he located at his present home in Fulton. Chester Pomeroy grew his first tobacco crop in the State in 1857, and a crop has been grown on the farm every year since that date. A still earlier date is claimed by S. S. Richmond, of East Troy, Walworth county, who raised a crop of tobacco in 1847 and on each succeeding year, except 1860. His crop was generally small and sold to manufacturers. During these 37 years the highest prices realized was 35 cents, and the lowest 7 cents per pound. From the beginning of this industry in the State as outlined, the tobacco interest has grown until it now stands to-day only second in the list of cigar leaf producing states. For the first few years those engaged in tobacco culture met with but indifferent success. It took years to establish a market and to demonstrate that Wisconsin tobacco was of more than average quality. A few New York buyers controlled the market and held the prices down, so that the grower realized but a small proportion of the profits on his industry. To free this monopoly the "Wisconsin Tobacco Growers' Association" was formed and samples of Wisconsin leaf were sent to all the large manufacturers, opening the eyes of the trade to the fact that Wisconsin tobacco was equal if not superior to the seed leaf of any other state. New buyers came into the market, and from that time on the area devoted to its culture increased with each succeeding year. In 1874 the total acreage reported by the different county clerks was 1,444 acres. Ten years later the same records show an increase to 15,836 acres. About fourteen-fifteenths of the entire crop is cultivated in Dane and Rock counties, of which Dane has 7,585 and Rock, 7,084 acres. The towns of Christiana, Pleasant Springs, Dunkirk, Dunn and Albion, in Dane county, and Fulton, Porter, Union, Janesville and Center, in Rock, are the leading tobacco towns. The village of Edgerton being the geographical center of the tobacco district, was the first shipping point and market, and is yet the principal receiving place for this product. There are located there twenty-five packing houses, which handle from 8,000 to 20,000 cases each year. In addition there were ten new warehouses constructed. Stoughton has fifteen, Janesville sixteen, Evansville three, and Madison four tobacco warehouses, while two are located at Milton Junction, one each at Milton, Ft. Atkinson, Albany, Marshall, Sun Prairie, De Forest, Brooklyn, London and two at Deerfield. Thus there are not less than seventy packing houses in the State.

## THE EDUCATED TOBACCO GROWER—PRACTICAL SUGGESTIONS.

*(Cor. Baldwinsville, N. Y. Journal.)*

Whoever engages in growing tobacco or any other product on a farm ought to be as thoroughly educated and posted in the various necessary educational branches, as any person who makes a regular profession his special business. He who thinks an inattentive farmer can grow crops as well as he who is agriculturally and practically educated, labors under a great mistake. It cannot be possible that an ignorant man, uneducated and unread, can cultivate a piece of tobacco, raise it from the seed, and carry it through all the various stages required to make it merchantable for the world as well as he who possesses proper attainments with proper learning and intelligence, the two individuals being equal in all other respects aside from their education. All must admit that there is no place for slothful and slovenly people on a farm. A skillful farmer should really have more knowledge than the so-called professional men in one sense of the word; for the trained agriculturist is presumed to understand manual and mental labor, and ought to have mental culture fitting him properly for raising his crops in an intelligent manner. This mental culture coupled with practice is what makes him a professional agriculturalist. Why not a professional tobacco grower as well as a professional lawyer or architect?

Placing two men side by side—every thing else being equal, the one an intelligent, reading and educated man, the other an uneducated and non-reading man—which one, we ask, would be most likely to get along in the world, and which of these gentleman would most probably succeed in growing the best and most thoroughly cultivated crop of tobacco? The reading man of course—the one who reads the agricultural papers and books on practical agriculture. There are hundreds of tobacco growers and farmers in the country who would make just as good doctors and lawyers, with good opportunities, as many of those who are now practicting these professions. It is a mistaken idea that farming does not require brains. The amount of brain work necessary to produce good crops and to making farming a paying business is just as great, indeed it would seem to be greater than that deemed necessary to be expended in any of the professions now-a-days.

Intelligence, skilled workmanship, and science are rapidly growing among the farmers of this period. The necessity for education and a large degree of reading of the right kind among tobacco growers and farmers is quite as apparent and needful as among college professors. There is much to be learned by reading the well conducted agricultural papers and works published at this time; but he who would learn must read and observe, study and experiment, introduce new and practical systems of farming, try new varities of seed, new and considerate methods of tobacco culture, new methods of curing the leaf to advantage, and observe what others are doing and how they do it, who are successful growers.

The well read and observing tobacco grower would hardly venture now-a-days to top his tobacco high; he would top it low and sucker it well to succeed. Nor would he build a shed for curing it unless he first made inquires and observed how the best ones were made. He would follow the most approved methods of assorting and packing, and post himself, in a thorough manner as to the best plans to adopt by reading and inquiring how to produce one ton of leaf to the acre instead of twelve hundred pounds of inferior tobacco.

In everything we do—in all our labor both mental and physical—intelligence and reading seem so essential that it is like folly for the most humble farmer to do without agricultural papers and books. One needs to read these in order to keep up with the times and know what is going on in the world in an agricultural point of view. We must be practical, too, and adopt method, system and common sense if we would make successful tobacco growers.

## SOIL FOR TOBACCO.

The wide variation in the character of soils on which tobacco is grown in seed leaf producing states makes it outside the province of this work to lay down any rule that would hold good in all sections as a guide in the selection of soils for tobacco. As a general proposition, any well drained soil in any part of the United States capable of producing Indian corn can produce tobacco. By this statement we would not have our readers infer that tobacco can be grown with success, or at a profit wherever Indian corn is produced, but the proposition that it will mature and ripen, holds good. The heavier and darker soils invariably producing the darker types. There are three classes of soils recognized by the tobacco growers of Wisconsin. First, the calcareous sandy; second, clayey soils, light and dark; and third, prairie soils. The first produces a plant that matures a week or more earlier than the others; the leaf is apt to be light in color, elastic, thin and silky. On quite sandy soil the leaves often grow rough, lacks tenacity and very often devoid of the main esstential, gum or finish, as it is more commonly called. Clay soils, varying from light to heavy, grow a good quality when not too heavy and well drained. The timber growth of this soil with a hazle under-growth, after the second or third crop, will produce the very finest quality of leaf grown in the State. On heavy clay the tobacco seems inclined to grow too thick and coarse. The third class of soils, prairie, produces by far the largest proportion of Wisconsin leaf. It is naturally rich, deep and black and when well drained as most of it is, the very best results are obtained. It produces a leaf large in size, soft and silky, even in color and rich in gum or finish. The soil lies loose and requires less cultivating than clay lands and is less liable to wash. The largest yields per acre is obtained from prairie soils. Tobacco grown on new land has a harsh, woody, stiff leaf, inclined to be light colored and contains but little gum. The working of the soil one or two seasons with an application of fertilizers

changes the character of the leaf, gives it elasticity fit for wrapping purposes. A dark soil will sustain a more vigorous existence in the plant than a light soil, other things being equal. The reason for this is apparent when it is considered that dark colors absorb rays of light and light colors reflect them. The more sunlight that can be absorbed by the earth and the plant, the more vigorous the growth. The myriad rootlet mouths of the plant will discover the hidden ray and devote it to its use. The dark colored soils are warmer in cold periods, and they are colder in hot, by reason of the lessened reflections from the surface. Every argument is in favor of the dark soil. Witness the richness in growth of the soils made dark by the carbon of decaying vegetable matter in the great West and in bottom lands generally. The color partially accounts for the vigor of the soil.

On all dark soils the season begins earlier and lasts later. The dark soils imprison the sunshine by absorption and hold it for gentle distribution to the need of the plant, while from the light soil it rebounds with arrowy and destructive intensity. In the reflection of the sun's rays from any object they are gathered together and are more severe than the direct rays. The burning glass is an example.

The lay of the land to be selected for a tobacco field is a matter of small importance providing it is well drained and sufficiently level to prevent washing. Moderate slopes running to the east are preferred by some as the effect of the early morning sun is visible upon growing tobacco. Slopes jutting upon water courses and lakes are considered good sites as the influence of the water often prevents early frosts. Avoid low sags or cold, wet fields as being the first to be touched with frost. Select for your tobacco field the richest land your farm contains, and if not naturally rich, make it so artifically—you cannot get it too rich. Manures upon tobacco lands pays better returns than upon any other crop.

### DOES TOBACCO EXHAUST THE SOIL?

The question is frequently asked if tobacco does not impoverish the soil, and none can be more easily answered. In Virginia thousands of acres have become barren, but careless farming did it. The farms of Lancaster county produce better crops to-day than they did twenty years ago. The land is richer and more productive. Not an acre lies waste. From three to five per cent. of this land is thought as much as a farmer should put in tobacco. It is very heavily manured, and the crop of wheat, which nearly always follows tobacco, is better on tobacco ground than elsewhere on the farm. The manure makes the two crops. The farmers understand the situation. Should they observe deterioration in their lands this crop would at once be given up. But under the present system deterioration seems impossible. Thirty years of tobacco farming has steadily improved their farms.

The Pomeroys in the town of Fulton, Rock county, have raised tobacco on the same lands every year since 1858 and their farms are

to-day richer and more productive than thirty years ago.

The value of manure depends upon what is fed: Too often farmers in feeding have no regard to this fact. They look upon the worth of the manure pile according to its size alone, not bearing in mind that manure from certain kinds of feed is twice, three times or ten times more valuable than that from other kinds. To be sure, it is well known that hen manure or the contents of privy vaults are very rich as fertilizers, but this is often attributed to the mere fact that hens and human beings are the producers instead of, more correctly, that the food from which these come is very rich in those properties that go to the making of rich manure. The manure from beans, peas, linseed cake, malt spirits and wheat from bran fed to animals is worth comparatively from twelve to twenty times more per ton than that from carrots, turnips, mangles, parsnips and potatoes similarly fed. That from cotton-seed cake is exceedingly rich, being in all essential properties worth nearly thirty times as much, on an average, as that from the roots named. The grains, oats, wheat, Indian corn and barley yield manure worth about one-half or less for a given weight, than that from the articles first named above. That from clover hay is worth rather more per ton than that of any of the grains just mentioned, while from meadow hay is about equal to these. The manure from one ton of clover is worth as much as the manure from a ton of wheat straw and a ton of corn stalks together. Bean-straw and pea-straw are worth a half more per ton for adding value to the manure heap, by feeding than that of the straw from the cereals such as wheat, barley and oats.

Clover is exceptionally useful on wornout soils. Its varied offices restore the finer elements essential to the best forms of plant growth, but the use of it as a substitute for manure is a howling delusion. It will no more take the place of annual fertilization than a drink of water will satisfy a hungry man. Used instead of manure it only giving the ground its own—it can only put back what it takes out.

It is a well attested fact that tobacco grown on land where clover is substituted for manure is invariably thin and weak, lacking gum, body and substance. In short, it is a ghost, deficient in everything that goes to make up all that is desirable in cigar leaf.

### TOBACCO STEMS AS A FERTILIZER.

The four leading constituents of plant food which must be present in all productive soil, it is well known, are nitrogen, potash, phosphoric acid and lime. By a continuous course of cropping, these elements can be so reduced that the result, a barren soil, is sometimes seen even in this highly favored Connecticut valley. Now it has been demonstrated over and over again that such soils can be restored to their original condition of fertilitiy by a judicious application of the lacking elements of fertilization and that each and all of these can be easily furnished to the soil in the form of animal manures and commercial fertilizers. But some other substitute is needed in places where it is

not convenient to procure large supplies of expensive animal manures, and immediate results are desired. Something is demanded that is economical and efficient. I have found several good substitutes which have worked well in producing excellent crops and in keeping up the fertility of the soil.

For several years past I have experimented extensively with cottonseed meal, which contains a large percentage of nitrogen, lime, bone, meal and tobacco stems in bales procured from cigar manufacturers. In addition to the large amount of potash and lime, the stems contain also a small percentage of nitrogen and phosphoric acid. Their action on the soil above the amount of ash constituents they contain, in furnishing organic matter (humus) to the soil, is like that produced by stable manure, operating as a mulch, retaining moisture and the valuable ammonia which under ordinary conditions has a constant tendancy to escape into the atmosphere, also preventing to a great extent the injurious effects of a long season of drouth. I have obtained excellent crops of tobacco by the combination of cottonseed meal, bone, lime and stems. Their analysis proves that they two together combine the elements of an almost perfect manure that will produce superior crops at less cost than can be obtained in any other way known to the writer. The tobacco stems alone, I have proved to my own satisfaction, to be a good fertilizer for potatoes on poor, worn-out, neglected soil during the last two years.

It is an accepted maxiom among farmers that "like produces like," and the leaf stem being akin to the leaf in tobacco, then it follows that tobacco stems should furnish what is needed to grow tobacco. Their value as a fertilizer is well known to florists and market gardeners in the vicinity of great cities.—S. G. HUBBARD, Hatfield, Mass.

### MANURES FOR TOBACCO.

The Harrisburg Independent makes the following deliverance on a very important matter to farmers. It does not contain much that is not well known to practical tobacco growers, nor does it very cleverly point out to novices the best method of manuring; but we print it as a contribution to a subject that is very imperfectly understood, and upon which there is a wide difference of opinion, even among the most successful tobacco growers:

"It is claimed that the tobacco growers of Lancaster county and other portions of this State are dissatisfied with the result from the use of artificial fertilizers on tobacco. Whether the farmers or tobacco growers in general make this statement, or whether it comes from a few, is not clear, but several agricultural journals are advocating the use of barnyard manure only for tobacco. A look over the fields will convince tobacco growers of the fact that they have been placing their confidence almost entirely in superphosphate. This substance, while beneficial to a certain extent, is only a partial fertilizer. Tobacco requires

a large amount of potash, and in tobacco regions of Virginia and North Carolina the growers have made the best crops by burning brush over the fields in order to get the ashes. Very seldom do they use any manure, and this course has done much to depreciate the value of the soil. Magnesia is another substance demanded by tobacco, usually left out in applying fertilizers. The crude sulphate of magnesia (impure Epsom salts) is a cheap article, the market price seldom going beyond half a cent per pound. It furnishes a soluble ingredient for tobacco plant food. Bulk does not always mean value, nor does a liberal application of manure made from straw and other inferior material prove as satisfactory as that from animals in good condition and fed on grain, good hay and oilcake. The manure heap, if it is of good quality, contains usually all the elements for plant food, and when fertilizers are used they should be prepared in strict compliance with all that is demanded with the formula. It should be borne in mind by novice tobacco growers that so far as the quality is concerned, new land produces a different effect from old; wet seasons from dry; good cultivation from bad; heavy land from light; new manures from well rotted, and, finally, that if the slightest mistake is made in curing the crop damage is done. Thus it can be seen that there is much to be taken into consideration before the tobacco growers can make a just comparison between artifical and barnyard manure for use on that crop."

SALT INJURIOUS.

I desire to remind the growers of tobacco that the use of salt in connection with the growth of tobacco will destroy the burning qualities of the leaf. A few years since a neighbor who used quite an amount of salt and plaster on his tobacco land was quite elated over raising as nice looking tobacco as I ever saw. His disappointment was at its height when it was found that the tobacco would not burn. A cigar rolled from this leaf would, when smoked, look like a piece of stove pipe. Salt will always produce the same effect upon tobacco, hence growers should look sharp at some of the special fertilizers prepared especially for use that they do not injure their crops by the use of substance. It is rumored that some of the compounds of fish and potash contain salt, and perhaps this may be the case with some of the chemical preparations sold as fertilizers.

ON FERTILIZERS.

The tobacco plant quickly shows improvement from any food given it. If the bed be but slightly moistened the young plants will bristle with gratitude, a sprinkling of wood ashes will clean and strengthen, and judicious supply of liquid manure will cause them to spread and crowd and grow vigorously. An occasional watering with milk-warm soapsuds is benefical, and the most acceptable food of all, in this limestone soil, is a moderate application of poultry manure. Of course practical planters understand that young plants, like young children

will appropriate too much rich food if placed within their reach, and that too great of tit bits will injure.

In the ordinary plan of rotation of crops as is the practice with all Western farmers, it is found that poultry manure is one of the most valuable fertilizers that can be used, yet on a majority of farms it is allowed to waste without an effort being made to save it. There is no difficulty or expense in cooping poultry at night through the winter, and changing their roosts outside for the summer, so that the droppings may be saved. Poulture manure, being nearly free from water, is more concentrated than that from the stable, and being rich in ammonia decomposes very rapidly. It should never be used alone, but can be properly prepared with road dirt or muck. One part of the manure should be composted with two parts dirt, and the whole thoroughly mixed. There are two methods of preserving this manure. One is to mix as above and keep perfectly dry; another and an excellent method is to keep the mixture always moist with strong soapsuds, not clear water, which not only hastens the process of decomposition but fixes the active principles by direct union with the fat acids. Wood ashes are unfit for mixing with poultry droppings, as potash in the caustic state rapidly liberates ammonia. As a starter for young plants no other fertilizer will do so well as a handful of this mixture placed in the hill. After the plants are well underway they may, with benefit, be treated to a good handful scattered around the hill.

Another source of waste about the stables and barnyards, is the liquid manure that accumulates from rainfall in the low places, some of which may leach through manure still unremoved, and is rich in fertilizing material. This should not be allowed to go to waste. Any litter that is convenient should be applied as an absorbent. No labor upon the farm pays better than to save the urine of all the farm stock by means of absorbents. In ordinary farm practice this is lost, no effort is made to save it. Cisterns need not be built, for they are expensive, but a good plan is to have convenient to hand a supply of marsh sod, or sawdust, or straw, as an absorbent that should be cleaned up every two or three weeks and thrown upon the manure heap. With care like this, splendid compost can be made, and the plan once tried will not be abandoned. Tobacco growers are rapidly learning the value of fertilizers, and that the checking of this great waste is one of the most profitable of a farmer's winter work.

As to the application of fertilizers, there is in the tobacco field decided objection to surface spreading unless the manure is to be plowed under within reasonable time. Scattering manure broadcast unless it is very plenty, it is a loss to the tobacco. Manuring the hill and mixing thoroughly with the soil, although more laborious, will pay well.

The tobacco plant is a surface feeder, that is the smaller roots occupy the soil nearer the surface and will feed and thrive better upon the fertilizer that is covered with but two or three inches of soil to save it.

In times of drouth the roots will penetrate much deeper for moisture, or will seek a fertilizer wherever it may be placed; but to simply supply nourishment for the one crop of tobacco, the soil need not be enriched to any considerable depth down, but the owner of the land desiring to keep it in good condition, will of course, endeavor to mix the manure all through the soil as deeply as either corn or tobacco roots will go. A thorough farmer tills the soil for all crops alike one year after another, plowing deep, stiring the soil with the manure, providing a rich mellow condition for the roots, large and small, to gather moisture and sustinence.

The American Agriculturist says: It is often difficult to decide—for barnyard or stable manures, or for any artificial fertilizer—whether to put in the hill or broadcast, and whether to apply it on the surface or bury it deeply. If not strong enough to injure the first tender roots, a little manure at hand gives the plant a good send-off, like nourishing food to the young calf or other animal; the aftergrowth is much better if the young animal or plant is not dwarfed by imperfect or insufficient diet. Therefore, drilling inocuous hand fertilizers in with the seed is useful, as is putting some well rotted manure or leached ashes into hills of corn, potatoes, indeed, with all planted seeds. But there are good reasons for distributing most of the manures or fertilizers all through the soils, and as deeply as the plant roots can possibly penetrate. The growth and vigor of all the plants or crops depend chiefly upon a good supply of strong roots that stretch out far, and thus gather food over the widest extent of soil. If a flourishing stock of corn, grain or grass, be carefully washed, so as to leave all its roots or rootlets attached, there will be found a wonderful mass of hundreds and even thousands of roots to any plant, and they extend off a long distance, frequently several feet—the farther the better, to collect more food and moisture. Put some manure fertilizer in place two feet away from a corn or potatoe hill, or from almost any plant, and a large mass of roots will go out in that direction. So if we mix manure or fertilizers well through the soil, they attract these food-seeking roots to a greater disance, and they thus come in contact with more of the food already in the soil, and find more moisture in dry weather. A deeply stirred soil, with manure at the bottom, develops water-pumping roots below the reach of any ordinary drouth and the crops keep right on growing, all the more rapidly on account of the helpful sun's rays that would scorch a plant not reaching a deep moisture.

In answer to the question what is the best chemical manures to buy for tobacco, Mr. S. G. Hubbard, of Mass., writes as follows:

For a satisfactory auswer, a knowledge of the soil constituents of the given locality would be necessary. In so far as soil is more or less deficient in potash, lime, magnesia, and phosphoric acid, these must be supplied. A formula of several successful growers in the Connecticut valley is about as follows: One cask of lime previously slack-

ed by exposure to the air, 400 lbs. of sulphate of potash, 500 lbs. of pure bone dust and 2000 lbs. of cottonseed meal sown separately broadcrst over one acre of land and harrowed in. A good foundation of humus should be present in the soil or be supplied in the form of common stable manure or vegetable substitutes.

The lime and potash are used to improve the quality of tobacco, particularly the burn. The burn of a cigar is unsatisfactory when it starts off white and soon changes to an earthly yellowish color, which shows it to be deficient in potash. When potash is present in sufficient quantity, the burn will be white with a bluish tinge, and will be clear which quality it will retain until consumed. The inquiry suggests a problem that could be worked out at our agricultural college—to find by analysis the relative amount of the several elements which form a perfect tobacco as compared with tobacco good and bad taken from various sections. The information gained would be of great value to farmers.

### TOBACCO SEED.

The question of seed for the tobacco crop is one that every grower should interest himself in. Shall we continue to use the same seed we have grown on the farm year after year, or try some earlier date Spanish? "What is the use of changing seed," says one grower, "when I have no trouble in selling my crop for a good price, and have used the same seed each year over and over? It's good enough for me." It would take considerable argument to convince this farmer that his practice was not a good one. He measures his theory by the results obtained, and the size of his wallet is what tells best.

The writer recognizes that it is of little use to talk to Wisconsin tobacco growers about scientific theories concerning the degeneracy of seed, or change in varieties grown, or improved methods of culture, when the market booms and buyers loose their heads, as has been the case with the '83 and '84 crops. When a run-out and shoe-string crop will bring as much as the finest qualities, when quantity alone is the point buyers consider, when weight means money the grower is not going to bother himself to change a leafy, thick-veined varities even if it is only one remove from seedleaf for a fine-leafed and smaller tobacco yielding only two-thirds as much per acre. There is, however, one or two points we desire to call attention to:

Wisconsin enjoys an enviable reputation as a Tobacco State. It is this reputation which has brought to our tobacco farmers good prices for the present crop while other States are neglected and growers are now almost begging for a market even at smaller prices. It means that if western tobacco can hold the advantage they can reap golden benefits. Now, it has become a serious question if the good name and reputation of Wisconsin Spanish tobacco can be maintained if our growers are careless and indifferent as to the varieties grown and the methods of culture. The writer insists that it cannot be done. Again:

buyers will not always be crazy. The time will come when there will be no boom or excitement in our market and the crop will be bought strictly on its merits. Fine tobacco will bring the best prices, and the coarse, overgrown rubbish will grade where it belongs. Then the farmer who pays strict attention to his seed and culture will reap the benefits of experience and knowledge. Talk with any of the buyers who are packing in this market, and they will tell you that a large proportion of the present crop is too leafy and veiny or, in other words, run-out. That new and better seed is needed. Spanish tobacco, to make a desirable wrapper, should be of medium size, small-veined, and of fine texture and finish; in fact, the virtues of original Spanish of ten years ago.

There will probably be a hundred different persons supplying seed to growers in this State every year. If this number could be reduced to one party, and the seed known to be right in every particular, the reputation of Wisconsin tobacco would be improved. The first element of success in tobacco culture is good seed. Don't forget it.

### HOW TO CARE FOR SEED.

To be absolutely sure that your seed will grow it should be housed before a frost. If the entire stalk has not ripened, pick the ripe pods off and place them in a dry place until all the moisture has evaporated. If the heads have ripened and you have any quantity of them, string them upon lath and hang in the sheds until dry when it can be shelled. After the seed has been shelled it should be put into glass jars, tin cans or cloth bags in some place where it will not gather moisture or the mice molest. When seed has been thus carefully preserved its age will not injure it and can be planted with safety for years.

### A SMALL MATTER.

*(Wisconsin Tobacco Reporter.)*

Tobacco seed it is claimed, is the smallest seed in proportion to the size of plant it produces, there is known in the vegetable kingdom; and further, it produces more seeds than any other plant in existence. The editor of THE REPORTER has been growing a small garden plat of tobacco seed the present season, and being on rich ground the plants grew thrifty and large. A few days ago curiosity prompted us to count the seed pods on one of these plants. The result gave 298 well developed pods. The number being greater than we expected, we thought we would gratify our curiosity still further by making an attempt to count the contents of one of these pods. The task was no small one, but by opening the pod on a sheet of white paper and using a magnifiying glass it was finally accomplished with a fair degree of accuracy. The number was found be 3,412 seeds. A little computation would then show that the seed talk counted produced 1,015,776 seeds or enough to plant 125 acres if the seeds all grow, and if the tobacco produced would bring a shilling a pound it would be worth $18,375. Here is a seed that produces over a million fold! Think of it,

a single plant producing seed for $18,375 worth of tobacco! It hardly seems possible and yet it is said that figures won't lie.

HOW MUCH TO BUY.

An ounce of seed will sow a bed sixty feet long and five feet wide, and with good care will furnish twenty thousand plants, which will set a three acre field. It is an excellent fault to have plenty of plants when setting commences so most dealers count not less than an ounce of seed for every 2 acres planted. Some even buy more than this. A perfectly safe estimate would be 2 oz. for every three acres of ground.

HOW TO TEST SEED.

In the purchase of seeds one is apt to be deceived. A correspondent recommends a test which he has used for many years with complete success. It is that of fire. Take at random a number of seeds from the bag; say eight. Put some live coals on a shovel, and deposit each of the seeds successively thereon. Blow the coal and watch how the seeds behaves. If the combustion is slow, merely giving off some smoke, you may conclude the seed had some damaged germ; if, on the other hand, the seeds leaps and turns about on the coal, producing a dry sound (tac) proportional to the size, it may be inferred to have good germinative qualities. In this way the proportion of good and bad seeds may be ascertained. As for the larger seeds, such as acorns and chestnuts, it is sufficient to throw them into the fire, and keep them in view. If the quality is good this will be indicated ere long by detonation of the seed.

A correspondent in the Farm and Fireside gives the following directions for testing the quality of seeds.

My plan, he says, is to make a box six inches deep. Fill in four inches of good soil; on this lay a thin piece of muslin, just enough to fit the box, and make it nicely level on the soil. On this muslin put one hundred seeds of the kind you wish to test. Cover them with another piece of muslin, and an inch of earth. When done, water with slightly warm water and set away in a warm place. The sprouting process can be much facilitated by placing the box on the stove, daily, after the fire is nearly out, so that the stove is just warm enough to heat the bottom of the box. Otherwise the box can be set on bricks that are heated daily for the purpose. After four or five days lift off the top dirt and its covering of cloth carefully. Count the seeds that have sprouted, and if only fifty of each sort have sprouted, procure new seed. If over seventy-five are sprouted, and the sprouts all look vigorous, the seed will do very well. Of course, the greater the per cent. of those that sprout, the better.

THE VARIETIES TO PLANT.

The question whether it is more profitable to grow Seedleaf, or Havana seed is one which we think the experience of late years has decided in favor of the Havana, or Spanish as it is oftener called. In a strictly financial point of view it is often the case that Seedleaf will

bring the grower as large returns per acre as Havana seed. The gross returns per acre would not vary much, all things being equal, whether you sold seedleaf at 7 cents, or Havana seed at 12½ cents per lb. The trade, however, the last few years have almost entirely demanded the latter variety. The best policy for growers is to produce a leaf that sells readily upon the market and as the prevailing fashion has a strong leaning towards the Havana seed, it being so admirably adapted for cigar wrapping purposes, farmers have found that this is the variety to pin their faith upon. Still there are quite a respectable minority of growers who still presist in raising seedleaf as a portion of their crop, and are generally fairly successful. But few of the dealers in Wisconsin handle seedleaf making it much more difficult to find a purchaser, than heretofore. We hardly feel like encouraging tobacco growers to plant seedleaf so long as the trade is so partial to Havana seed.

HISTORY OF THE "COMSTOCK SPANISH."

Of all the "numerous" varieties of Spanish tobacco cultivated in our State it is quite generally conceeded that none embody so many virtues as that which is commonly known as the "Comstock Spanish." Having never been able to find any reliable history of this favorite variety THE REPORTER began a search for statistics and information that might be preserved and in a measure supply this deficiency. To Wm. T. Pomeroy, of Janesville, belongs the credit of first introducing Spanish tobacco in Wisconsin. In the fall of 1871 Mr. C. C. Mengel, of Westfield, Mass., was in the State looking after the prospects of our tobacco crop, and upon returning home, found a small crop of tobacco which appeared to him as being so much finer than the average crops that he purchased it at 50 cents per pound. He wrote to Mr. Pomeroy about it and at Promeroy's suggestion secured some of the seed which was sent west. In 1872 Mr. Pomeroy planted a small patch but the plants grew very tall and leaves far apart, so that he had but little confidence in the "new fangled" tobacco as it was called, and put away what seed had saved, not thinking it would amount to much. A small lot of this tobacco raised from the first seed Mr. Pomeroy sold at 75 cents per pound, and the seed probably reached perfection about one year later, when he gave his neighbor, Comstock, a little of this seed in 1876, and the latter planted a small field and allowed about ¼ of an acre to go to seed, producing 25 or 30 pounds. From this package the original Comstock Spanish was distributed. The next season a number of farmers about Cooktown raised small crops of the new variety which sold from 8 to 10 cents, while the common seedleaf was selling for 5 and 6 cents per pound. Mr. Comstock died in 1877 and a year or two later Wm. T. Pomeroy secured what remained of the original package of the Comstock seed. In 1878 Pomeroy & Pelton sold this seed to farmers at their store in Fulton. The Comstock family, Pomeroy's and the others who had obtained the seed, began to distribute it from this time on until it became very widely scattered. Prob-

ably three-fourths of the tobacco now grown in the State is a descendant from the Comstock variety, but through carlessness in preserving its purity and by growing year after year it has lost much of its character and virtures, so that but a small per cent. of the crop as a whole will to-day indicate that the seed is pure enough for further propagation. If any of the old original Comstock seed could be found to-day we know parties who would gladly give $25 per ounce for it and it would be cheap indeed at that price.

We have before attempted to impress upon the minds of Wisconsin tobacco growers that the future reputation of our state tobacco will much depend upon the improvement of the varieties now grown. Again we wish to say to them that if they can secure seed of the early date Comstock variety they will do much towards accomplishing this object.

PREPARING PLANT BEDS.

In the selection of soil for beds, choose preferably clay ground mixed with black loam. Let the beds be five feet wide and run, lengthwise east and west. Turn up the ground shallow—not over six inches elevating the surface three to four inches, with a fall of about two inches from north to south. Run six inch boards along the south side of bed, and eighteen inch boards along the north side to act as a reflector, on the north side, with triangular end pieces. Now cover the surface of the bed, barely, with chicken manure. Rake when ready to sow and cover with fine rotten wood and loam gathered from about a decayed log in the forest, to a depth of three-fourths to one inch. Take dry seed and mix with dry leached ashes, and sow on a still day. Do not mix the seed with ashes until you are ready to sow. Tramp with a board or pat with a broad shovel. Sprinkle the bed with water and draw the canvas tight over a bar across the center lengthwise, to turn showers. Keep the surface of the bed constantly moist—carlessness in this particular will be fatal. Remove the canvas every day for about twelve days before planting, keeping it off between the hours of 9 o'clock a. m. and 3 o'clock p. m., to harden the plants.

The annoyance to so many farmers every year in the loss of plants that were in beds exposed to frost is a lesson to be heeded. Low ground is more apt to be wet and freeze. On the selection of a proper locality for a plant bed, and its preparation largely depends the timely supply of strong, healthy plants, without which it is impossible to raise a crop of fine grade. The planter, therefore, can not be too careful in securing a sheltered spot, neither too wet nor too dry, as rich naturally as can be found, and located so as to possess different degrees of moisture.

The better location is a hillside of rich ground with southern or eastern exposure, well protected on the north and east sides. An old bed should never be used for a new variety of seed.

The ground should be well spaded or plowed in the fall. Dig a pit eighteen inches deep, five feet wide and the required length, fill three or

four inches with straw and cover with fresh rotted stable manure to the depth of six or eight inches, then cover with soil, adding wood mould, if convenient, five inches deep.

In the spring, as soon as the soil is dry enough to work, it should be forked and raked off fine and mellow. The bed may be greatly enriched by a thin spread of poultry manure about four inches below the surface, but it should not be placed to come in contact with the seed, but below to tempt the roots.

Build a cold frame around the bed with plank twelve inches wide on the north or upper side, and six inches wide on the south or lower side.

In ordinary seasons it is best to sow seed at three different times, about a week apart, say the first, second and third weeks in April, so that transplanting may be done in June, and a rush avoided in topping and cutting.

An ounce of seed will sow a bed sixty feet long and five wide, and with good care will furnish twenty thousand plants, which will plant a three acre field. It is important that the seed be sown evenly in the bed and not too thick. To avoid sowing unevenly it is a good plan to mark off the surface of the bed in squares. After sowing the seed, if the soil is dry, it is best to "form" the soil slightly with a light hand roller or wide board, after which the bed should be watered down or sprinkled heavily with warm water; the canvas or other covering should then be put on. Great care should be exercised during the first week after sowing the seed not allow the surface of the soil in the bed to become dry, otherwise the tender sprouts will be destroyed and failure will follow. Keep the bed wet by frequent sprinklings of warm water through a sprinkling-pot having a fine nose.

In this climate the beds will need protection from frost four years out of five, and for this purpose canvas covering is in popular use, which keeps the beds warm, promotes growth, and protects the plants. Canvas tacked on a light frame that fits the cold frame, answers every purpose and will last several years. A bed twelve feet long will require four sections of canvas covering which are light and handy and may be put on or off or adjusted at pleasure. When the plants have pretty well covered the surface of the bed, remove the canvas during the day and only replace them when there is danger of frost, or to keep off the bugs. There is the advantage of having earlier plants by this mode and perfect security against the plantbug.

Open air beds produce the best plants, and it is very well established that the plants will stand transplanting better and usually grow quicker than plants raised in either cold frames or hot-beds, but the risk of frost is too great, for it requires but a slight touch to kill; then the farmer must depend on resowing or borrowing from his neighbor.

It is the custom in some localities to sprout a portion of the seed, then in sowing mix dry seed with sprouted, to thicken growth, but we see no advantage in this, where the bed may be made large enough.

On a cold night or when there is danger of frost, the bed should be covered with old carpets, straw or boards, to prevent the young plants from being chilled. Late plants may be grown successfully without covering for the beds. Such plants are usually strong and healthy, but will rarely be ready to transplant before the 15th or 20th of June, which is rather late for planting, although many seasons plants that are set out after July 1st and are hanging in the sheds before the 10th day of September.

The beds must be kept moist and free of weeds, for thousands of young plants are strangled in hard, dry earth or starved by ravenous weeds.

If fleas attack the young plants be ready with a large piece of white canvas or a sheet. Let two persons hold it at the side of the plant bed while another whips the bed carefully with wisps of brush; the fleas will jump upon the canvas, then plunge canvas and fleas into boiling water. An experienced grower says that old sweated tobacco, rubbed up and sifted over the beds will rout these pests completely. A light sprinkling of wood ashes may be all that is necessary.

Growers will find that an occasional light sprinkling of liquid manure on the beds will prove very beneficial, as furnishing immediate food to the young plants and tending to give strong bushy roots and healthy plants. Overfeeding, however, is liable to bring delicate plants.

"What is worth doing, is worth doing well" is an old adage, and "a thing well begun is almost done" is another. So it is with tobacco culture. Three things are required to germinate the seed and make them grow, viz: Heat, Light and Moisture. Sprout the seed. Reason—you will not then plant poor seed, and the plants will get the start of the weeds.

### HOW FAR TO SPROUT SEED.

The Miamsburg Bulletin advises planters to sow an abundance of seed, and to make three or four sowings a week apart. Too much emphasis can not be placed upon this suggestion, the object being to secure choice plants to provide for replanting, and to take advantage of the seasons. The abominable practice of sprouting seed until the roots are so far projected that many of them are necessarily broken and destroyed in sowing cannot be too strongly condemned. If you will watch the sprouting of a tobacco seed under a powerful glass you will observe the shell first open at one end. To the naked eye it presents simply a white spot. This is the stage to sow sprouted seed. Beyond this is involved great delicacy in handling and risk in sowing. Next appear the fine rootlets, like vegetable mould, not one of which is superfluous. These are finer than the strand of a spider's web and much more fragile. The destruction of some of these makes no perceptible difference in the appearance of the plant, but careful experiments have demonstrated that such plants are responsible for much that is found objectionable in the Spanish leaf.

Mix the seed evenly clean with saw-dust. Put it in a pan and wet it, putting a wet cloth on top. Keep the saw-dust moist, not wet, and in a warm place, and in five or six days it will be ready and sprouted and ready to sow. You can sow the saw-dust and seed very evenly, as the saw-dust will show on the dirt. Don't sow too thick, as you cannot get good plants when so sown. After sowing the seed the bed should be lightly raked. The seed bed must be very rich and fine on the surface. After sowing, the top of the bed must be made hard, either by tramping, pressing down evenly and hard with a broad board by walking on it. When packed this way, it will not dry out as soon as left loose. To preserve moisture the bed must be covered, as drying the seed after sprouting will kill it. For covering we have tried hay, straw, corn-fodder, brush and cloth. In covering with hay or straw too much will smother the plants, and too little cause them to dry out. The amount of covering for wet weather will be too much for dry weather, and vice versa. Use cloth for covering; as it is the only thing we can cover with and be sure of getting a good stand of plants. It is extensively used in Kentucky and Tennessee, and the testimony is unanimously in its favor, as it has many advantages. To make the bed, drive stakes as desired, and on the north side nail boards about eighteen inches high, on the south side let the boards be about four inches high. Bank up with dirt to make it tight. Then tack on a frame made to fit the top of the boards common brown domestic. The domestic will be better if made water-proof. To make it water-proof use the following receipe: Linseed oil one gallon, dried sulphate of zinc and sugar of lead each three ounces, litharge eight ounces. Boil, with constant stirring, until it will drop into strings. Cool, clear off the clear part, and if too thick, thin with boiled oil. This varnish is flexible, and the cover can be folded or rolled as desired. Under this cover the keen blasts of Spring will not penetrate, and a more uniform temperature is preserved. Occasional watering with warm water will keep the surface of the bed moist, warm and light—the three essential things to make the plants grow. Good seed sown and covered in this way is bound to grow and make good plants, if kept clean of weeds. When the plants get a good start, the cover should be removed from nine to four o'clock, that the plants may harden. Don't sow too early, as plants may be grown in this way in two weeks, if the soil is rich and all right. We have had the beds green with tobacco plants in ten days after the seed was put to sprout. The next best method is to cover the bed thick with fine brush, and not remove the brush until weeding time. Should you fail in your plant bed, the chances are your crop will be a failure.

HOW TO RAISE PLANTS WITHOUT WEEDING

Proceed by placing the seed in a piece of flannel; tie it in with a cord; dip the sack and seed in luke-warm water until the seeds are thoroughly moistened. Fill a tin fruit can or any convenient vessel with loose, moist earth and bury the seed up to the neck of the

sack in the earth within the can. Place the can near a stove and keep constantly warm over night. This is a very delicate process and requires careful management. Those who have had no experience would best not subject all of their seed to this method for fear of failure. Bear in mind that the growth of the plant is generally acclerated by this course, the whole object of which, having destroyed weeds in the beds by early spading and subsequent raking, is to get ahead of weeds that may appear, or to compensate for late spring sowing. Any grasses that may spring up from germs in the wood loam or chicken manure can be quickly removed. The points to be guarded are, first to avoid carrying the sprouting of the seed far before sowing. For the beginner it is best to sow before the white germinal point appears upon the ends of the seeds. The experienced grower should not push his seed beyond this stage. The second point to be guarded is in mixing the seed with ashes. They should not be roughly handled, but gently and thoroughly mingled with ashes until the moisture is absorbed from them so that they will no longer stick together and may be sown evenly. Swelled or sprouted seed should not be sown earlier than the 15th of April.

Another writer and a practical tobacco grower says on the subject: While we discourage the use of hot beds for the growing of tobacco plants, we confess to a strong partiality for covering the ordinary open air bed with canvas. The advantages are so many that we have no room here to go into all the details. If burning the seed bed were practiced by our growers, and the beds afterwards carefully covered with canvas we believe they would rarely experience any trouble from beetles or bugs. The fire would destroy all in the beds while the canvas will prevent the entrance of any from the outside. The custom is becoming very general among the Kentucky and Tennessee growers and their testimony is unanimously in favor of its many advantages. It is not an expensive opperation. Boards six inches high placed aroud the beds and closely fitted at the corners are sufficient. Over these the canvas—common brown domestic will answer—must be drawn tightly to prevent sagging in the center and then tacked closely to the board frame. The keen blasts of spring are also kept out and a more uniform temperature is kept within. On one side of the frame the covering should be so slightly fastened as to admit of its easy removal when the beds or plants require attention or when it is desirable to expose them more fully to the sun. Of course where the precaution of burning the seed bed is not adopted neither boards nor canvas will afford protection against bugs, as they are no doubt in the soil and will make their way to the surface in due time.

### TO GET A GOOD BED OF PLANTS.

It is very essential to tobacco growers that they have, as a starting point, a good bed of plants. It may not necessarily be the earliest bed that can be gained, but one that is sufficiently early to insure the best

part of the season, and one that has plenty of strong healthy plants of good size. Opinions differ in regard to the best means of procuring such a result, and various methods are employed. Some start their plants under glass; others a little under cloth. Both methods have some advantages. For instance here a grower has a large number of acres to set, a very early bed enables him to begin setting a few days in advance of an open air bed, as well as to begin harvesting at an earlier date, thus prolonging the growing season. But the general experience has been that very early toacco is not, as a rule, as profitable as that set at a later date. About June 20th is the best time in average seasons, to set the crop, and many growers make an effort to set as much as possible at about that time. The great trouble with plants raised under a glass is that they are apt to have too much heat generated by the manure under them, and by the accumulated heat from the glass. They spindle too much, do not start as readily or as evenly when set in the field as more hardy plants, and require more care and attention if the glass is used or even cloth. I am in favor of using fertilizers of some kind instead of so much manure, particularly hot horse manure. The plants are more apt to be stocky if grown on fertilizer and not necessarily later if properly managed. The land should be made rich with manure the proceeding fall, and the fertilizer thoroughly worked into the surface in the spring. Sprouted seed is always the best to sow, either under cloth or glass, as well as in the open air if sowed late. The quantity area of bed should be put in a woolen bag—a stocking leg for instance—and wet completely in water at a temperature a little above blood heat, and then hung near the stove. Care should be taken that the seed does not become dried. Dip the bag in warm water two or three times in twenty-four hours, if necessary. In a very short time the seed will germinate and burst the shell. When the minute white germs appear to compose about half the mass, it is sufficiently sprouted, and should then be mixed with a small quantity of fine meal (say about a quart) and sowed. The meal is to facilitate the even distribution of the seed. If the land is rather light it should be rolled before sowing, and the seed very lightly raked in, then again rolled and immediately watered. The covering, whatever it is, should then be placed upon it, and until the plants are of the size of a three cent piece only removed when necessary to water the bed. After that time it is best to give the plants the benefit of the air during the warmest part of the day. Though this may somewhat retard their growth, it will harden them and render them less liable to wilt when set. If the plants look yellow and spindling and do not grow fast as they should, a solution of sulphate of ammonia may be use to good advantage. In fact it is advisable to use it upon most beds. About a pound of the sulphate, such as is used for agricultural purposes and costing about five cents, should be distributed in about thirty gallons of water, and a few pailsful applied with a sprinkler each morning, using clear water

immediately after it, as a solution of the above strength is too much for the plants if not diluted. This will restore the plants to a healthy, dark green color, and wonderfully promote their growth. This is better than the old plan of dissolving Peruvian guano and applying it to the bed. Although we get a solution of ammonia that way, it is of an uncertain degree of strength and sometimes we get an overdose which kills the plants. A dessert spoonful of seed is sufficient for a square rod. The plan of sowing dry seed in the fall is not generally very successful. Dry seed sown very early in the spring upon soil that is quickened by the liberal use of fertilizers containing ammonia and covered with brush or pine boughs and well watered, will generally yield plants enough by June 20th or 25th.

Mr. H. R. Hoag, of Walworth county, gives the following directions for preparing liquid manure for plant beds, the use of which he has found very beneficial. He built a large leach capable of holding about a wagon load of barnyard manure. To this applied several barrels of water. Before setting he marked off his ground and applied about a pint of the liquid to each spot where the plant was to be set. The plants were then set, and when they had grown to five or six inches another pint was poured at the roots. The effect on the tobacco was wonderful, both in starting the plants and in the subsequent growth. He treated only about one-fourth of an acre in this way, but it is certain that if he had gone to the expense of, say $5 an acre, to liquefy his manure, using only about three loads of manure to the acre, it would have made a difference in his crop of 200 pounds per acre and increased his gross receipts fully five hundred dollars. The advantage shown is in his less amount of manure required, and in the immediate effect seen is in starting the plants, and in their subsequent growth. This is a valuable hint, which we would like to see our tobacco growers copy.

A correspondent of the Country Gentleman writes: All that is required during the first two or three weeks after sowing the seed is to keep the surface of the soil in the bed damp, and to prevent scorching of the plants by raising the sashes when the sun shines very warm. Too much water is injurious to the plants and retards growth, and it should be applied to the bed through a sprinkling pot having a fine nose. The observing farmers of southern Pennsylvania have learned that no sprinkling which they can give their tobacco plants is so beneficial to them as a warm shower, and, hence, the glass is removed as rain approaches, unless it be a cold shower, when it is usually thought best to leave the plants covered, unless advanced in growth.

It is very rarely that a tobacco bed has been so carefully and skillfully managed that little or no weeding is necessary. In most cases weeding the plants is a long and tedious task. It is well to commence weeding as soon as the weeds become large enough to pull, and the more thorough the work is executed the better for the young plants, which need all the room and fertilizers in the soil for rapid and healthful growth. To hasten the growth of the plants it is customary and

advisable, I believe, to apply to the bed liquid manure. This may be made in several simple ways or it may usually be found already prepared in hollow places in the barnyard. There is nothing better than barnyard manure water unless it be soapsuds, either of which gives rapid and healthy growth to the plants and supplies to the soil the necessary elements of fertility for the production of plants.

There are two insects which have proved especially destructive to young tobacco plants while growing in the seedbed. I have never taken the trouble to procure their names, but have studied their characteristics in my own experience in plant growing, and have learned that the same insects are common in the Pennsylvania tobacco growing districts, as they doubtless are in all the seed-leaf producing sections. One of these insects is a flea, resembling the flea which plays such havoc with the cabbage plants. The other is a worm, ranging when full grown from a quarter to a half inch in length. It is small in circumference, many legged, and of a dark brown color, It operates in spots in the beds, usually where the plants are thickest. The first indications that are seen of the operations of this insect are the wilting of the plants and their apparent rotting. As the ravages of this insect usually occur in very hot, wet weather, I think the difficulty is very often called the plant rot. The worms eat off the plants just below or at the surface, leaving them to wilt or rot down under the effects of a hot sun and dampness.

The flea is probably best destroyed or prevented from injuring the plants by a light sprinkling of ashes, lime or plaster (gypsum) over the bed when the plants are damp. The worms are best destroyed by a strong application of soap suds to the bed, especially to those parts where the worms are found to be at work. I have sometimes driven the worms from the beds by dropping a hand of hard wood ashes in each spot where they had killed the plants. To avoid the attacks of these worms, it is well to use a considerable quantity of wood ashes for fertilizing the beds before sowing the seed. This method has proved quite effectual, and ashes make an excellent fertilizer for the plants, if thoroughly incorporated with the soil. Angle worms are occasionally destructive to tobacco plants. I have known them to come up in vast numbers from the subsoil, and in a single night nearly destroy a whole bed of plants. But they seldom trouble a bed where wood ashes have been used in any considerable quantity, and they may be driven back, if discovered in time, by applying soap suds to the plants.

### PREPARATION OF SOIL.

With full knowledge that farmers generally will rely upon their own practical judgment, based upon experience, conditions of soil, weather and season, and the requirements of their own land, we give the following points gathered from the best authorities on tobacco culture, and the recommendations of intelligent, successful growers of this section, in preparation of soil.

For any of the varieties, soil should be well worked and the manure thoroughly mixed with it, to this end plow as often as possible; for the more soil is plowed, the more thoroughly will the manure or other fertilizer be mixed with it. While many think tobacco ground ought not to be plowed very deep the first time, it certainly must depend upon the kind of soil, for it is not best to plow deep where the soil is shallow, and in deep soil the reverse is the rule.

The heavier the soil, the deeper plowing is necessary, and if it be new ground, it should be turned over in the Fall to a depth of eight inches. Heavy clay land must be tilled, and a liberal dressing of sand is the best fertilizer that can be applied. If sand be thus plowed and harrowed in, years of time may be saved in lightening the soil. If level clay upland be not tilled, in wet seasons the tobacco will french. Hillside fields are not so bad, but soil on level clay land will pack from moisture, checking the roots, stopping growth, and causing the plants to wither and french. Old, well fertilized, clean ground is best for tobacco, but planters do not follow any rule, and will use orchards, new ground, hill tops, or the rich loamy bottoms, as best suits their plans. There must be however, no neglect in preparation of the field, no labor spared in putting soil in proper condition. The land having been broken in the Fall, should be again plowed in the Spring, and at that time work in what manure or other fertilizer it is thought the land requires. Land can not be too rich for tobacco, yet it is not required that rotted manure be plowed under more than four or five inches, this gives it a covering and saves the fertilizer, and besides does not go deep enough to enrich the subsoil rather than feed the plant. In tobacco culture especially, the profits increase in proportion to the thorough preparation and tillage of the soil, therefore after this Spring plowing the land should be still farther improved by a light top dressing of manure, working it in the surface with the harrow. This surface application of manure, especially with rain will supply immediate nourishment to the young plants. It would be even better if the land were rolled after the harrowing, and it would be still better if a cultivator were used instead of the harrow. The soil must be kept light and stirred up, therefore if after this plowing, rains should come and the ground settle or pack before planting, it loses condition, and should be gone over with the cultivator. Keep the field rich and mellow to receive the young plants and give them a good send off.

An old planter tells us that he believes in plowing often and deep, to put the soil in condition to sustain the plants through dry seasons that we have four years out of five. He plows once inthe Fall and twice in the Spring, then scatters stable manure broadcast and harrows until it is thoroughly mixed with the soil, and he keeps his land thus mellow by using the cultivator so long as he can work a horse between the rows without injury to the plants.

PLANT TOBACCO ON THE LEVEL INSTEAD OF ON HILLS.

An Elmira (N. Y.) correspondent of the Country Gentleman, advances the following novel but yet reasonable view in reference to the culture of tobacco: Recent tests made at the New York Experiment Station, to determine some of the characteristics of the tobacco plants, have demonstrated that the roots do not penetrate the soil to as great a depth as those of corn, potatoes, timothy and most other of our common crop plants. Matured plants of tobacco, carefully taken up and the roots washed out, have shown the latter to lie near the surface where they occupy the soil for considerable distance on all sides. The tobacco plant being a surface feeder, and a lover of light and heat, it is probable that the common practice of forming hills about the plants during the process of hoeing and cultivating results in positive damage to the crop, retarding the growth and full development. I have frequently during the periods of wet weather seen the rootlets cropping out upon the surface of the soil between the rows; and where hills have been made about the plants, the roots forming above the normal height, will extend horizontally until they must come into contact with the sunlight which prevents further growth. It is a common belief that the hilling of tobacco in dry seasons prevents in part the injurious effects of drouth. While I am not prepared wholly to contradict this idea, I am quite well convinced in my own mind that the reverse is true; and, further, that in no case does the practice of "hilling," either with corn or tobacco, benefit the crop. For a number of years I have practiced level culture with tobacco, and I believe I have lessened the cost of production without decreasing the yield. In one case only would I advise the practice of hilling tobacco, and that is where purslane ("pussley") is troublesome, as is the case in some tobacco fields by covering in this section. This weed is best subdued in the field by covering it up with soil, and when hoeing tobacco, where it is found to exist largely I have found it advisable to draw up mellow soil from between the rows and cover up the purslane plants, which necessitates hilling up the tobacco somewhat.

HOW MANY TOBACCO PLANTS TO THE ACRE.

The question is frequently asked, "How many Havana tobacco plants shall I set on an acre of land?"

An acre of land is 208⅔ feet square, and is also 2,504 inches square. An acre contains 160 square rods. An acre also embraces 43,520. square feet, and 6,296,880 square inches.

If Havana tobacco plants are set out on one square acre of land, sixty-four rows (three feet and two inches apart between the rows) are necessary to fill the acre, and 125 plants are necessary, twenty inches asunder, for each one of the sixty-four rows, thus requiring 8,000 plants to set out an acre in the manner described.

A square acre set out with the rows three feet and two inches apart, and eighteen inches in the rows, takes 8,890 plants. In this instance

it requires sixty-four rows to fill up the plot of ground, and 139 plants to each row.

A square acre set out with the rows three feet apart, and eighteen inches between each plant in the row, will take 8,730 plants.

Presuming that a thorough grower raises tobacco heavy enough so that five plants would be sufficient to turn out one pound of cured Domestic Havana leaf, then allowing that 9,730 plants can be set out on an acre of land, the yield would, according to this calculation, be 1,956 pounds to the acre.

In order to grow a beautiful, fine, and profitable leaf it seems necessary that our growers should put their plants close together—say about 9,000 to the acre—and thus raise tobacco equal to the Sumatra wrappers.

### WHEN AND HOW TO TRANSPLANT TOBACCO PLANTS.

Here is advice that is timely and worth considering: When a tobacco plant attains the proper size for transplanting, delay in setting it out at once is dangerous, for if crowded for room on the bed, the longer it remains untransplanted the more certain it is that much valuable time is being lost, besides the plant will grow more and more spindling the longer it is allowed to grow in the bed—thus making it what the growers properly call a "shanghai plant." We are of the opinion that the proper and safe policy to adopt is not to wait for rain when the plants in the beds are sufficiently large to transplant; but on the contrary, commence at once to water the hills by artificial means—and make use of a pointed stick to make holes three or four inches deep in the hill and one inch deep in diameter, into which pour a good supply of water. In these holes set the plants with unusual care, and they will live as well as those set out after a heavy rain, and some growers state that they will do better. The purpose of the grower should be to expedite the setting out of his plants as rapidly as possible in order to get them growing without delay. Some farmers wait several days, if not weeks for rain, but if they would set out their plants when they grow to a suitable size, their tobacco would have plenty of time to mature—could be harvested early, and would have time to make a good growth.

### THE TIME TO SET OUT PLANTS.

It is not good policy, in my opinion, to set out Havana tobacco in our climate later than June 20th to 30th. It would be well to commence operations about June 10th to 15th. It requires from seventy-five to ninety days for plants to grow and mature with us. True, Havana grows and ripens sooner than seedleaf, and they require to stand longer after topping—say twenty to twenty-eight days. Hence how plain it is that we should use common sense and not only raise early plants, but set them out early as well. Do not wait for rain, if it does not come in time to set out your plants, but set them in water, in order to further your interest and get the Havana plants on their feet in time so that no risk will be run on account of frost, etc.

I believe more than two-thirds, if not three-fourths, of the growers in 1883 (and also in some previous years) put out their plants too late.

Now, in a word, the best possible plans should be adopted by our growers for improving the early raising of plants, chiefly and truthfully because the risks are too numerous, and the danger too imminent to attempt to raise good crops of Havana and tobacco in climate by the late setting of plants.

TRANSPLANTING IN DRY WEATHER.

This question which has become one of the decided interests should be well inquired into, and when it is once well understood it will be found to possess far more importance than any one would at first believe. It has been only a short time when it was the rule to wait for a rain before setting plants, and as soon after a shower as possible all hands would get to work to do their transplanting; and now, those who have posted themselves well up in the matter, would rather set out their plants in dry weather than after a rain. Not a great many years ago many people would wait for certain signs of the moon before sowing their seeds; but as we have come to altogether disregard such an allusion, we shall equally disregard the idea that we can transplant only after a shower, and go right on and do it at any time, only observing due care. The way, therefore, people now do who understand how things can be done, is to go over the ground where the plants are to be set, and make the necessary holes deep down in the soil with a dibble, where the plants are to grow, and fill these holes with water. This will soon soak away, leaving the ground in a half dry, half wet condition. The plants to set out are then taken from the seed-bed, and the roots doused in a vessel of water, and then one by one are taken out and put into the holes, pressed firmly, and the work is done. They need no more water, will wilt very little, and go right on to grow, and far better than when half a bucket of water is poured around each plant when set out and then let alone for a time, at least.

Should dry weather follow, the plants must of course be again watered, but not in the old way of pouring around each plant a gallon, only to run away and do no service. How then, it will be asked, are they watered? A little of the earth is removed from the plants by a hoe, so as to form a sort of basin about it, a moderate quantity of water is poured into the basin, and in a few minutes, the water having all soaked away about the roots, the earth is restored around the plants, and the surface is as before. This prevents the water from running away, and the sun from baking the earth, and the wet soil underneath will be retained, and not more than two such waterings will be required to continue the steady growth of the plants during any dry spell or even prolonged drouth.

If this hint is taken up and properly pursued, it will not only save a great deal of hard labor, but it will insure a good and satisfactory

crop; and we suggest that it be tried by those who "live to learn," and desire to reap the best harvest from whatever might be sown.

### TO REMOVE PLANTS FROM THE BED.

Mr. H. S. Pomeroy gives the following directions for removing plants from the beds: Soak the bed well and pull the plants with a table fork. Keep the plants straight and dip the roots into water. Let them drain a minute, and place carefully in the basket with the roots toward the center. Take a lath or other stick and break the crust in the center of the hills, but do not make deep holes. Now pour about half a pint of water on each hill. In about ten or fifteen minutes set the plant. Set while the dirt is still sticky, but not too soft. By having one or two ahead and water the hills, the setters can follow at the right distance to have the soil in right condition. Do not water after setting as it will do more harm than good. Tobacco carefully watered out in this way do nearly or quite as well as when set out after a rain, but will require more labor. Do not set large and small plants together, but have them of even size. Do not let the plants wilt or the roots dry after pulling or before setting.

### PLANTING TOBACCO.

The effort is to keep the ground loose and mellow for the tender roots to readily take nourishment at first setting, that the soil may be in this condition to encourage the roots to spread, giving favorable start to the plant. The grower is to be ready to take advantage of the first favorable weather. If the ground is too dry, the plants are to be watered as they are set out. Haul the water to the field in barrels and pour a cupful in each hole; this will make moist earth for packing loosely around the roots. The plants may need watering for a day or two, or at least until thoroughly revived.

The poorer the land, the closer should the plants be set, to protect the ground and plant from the hot scorching suns. In rich ground, set in rows three and a half feet apart, and plant from twenty to twenty-four inches apart; but, if the land is poor the rows should be three feet apart. All conditions being favorable then, and the plants showing leaves as large or larger than silver dollars, select plants of even size, low bunchy tops if possible, as they are sure to be strongly rooted; and draw from the bed one at a time. As care must be taken not to injure the roots or leaves, the seed-bed should be moist enough to let the plants be pulled easily. Slender, spindling plants are not desirable nor should small ones be set out except to complete a planting. Have a care in pulling the young plants from the beds, nor to tear or bruise roots or stock, nor keep them out of the ground too long. In setting giving the roots their natural position, so as not to cramp them; draw the dirt nicely around so that they may take food and moisture at once. Such attention will pay well and will not delay the work.

If the ground is wet, or it should rain soon after planting, they will

soon take root; and although they wilt during the day, they will recover at night.

The cut worm is the first enemy to be conquered in the field, and he is liable to open the attack at once the plants are set, and to keep it up until the leaves are five or six inches long; therefore go over the field day after day until the stocks are hardened enough to resist the worm. He is readily found. A leaf will be eaten off, or the entire stock, and you will see it wilted and partly drawn into his hole. There may be one or more. Early morning is the best time to hunt him, as he is then nearer the surface; later in the day the sun drives him deeper in the soil. From these pests much replanting will be necessary. Close watching will cause them to disappear as plants grow stronger. If the plants are not set out until they are strong enough to resist the shock of transplanting, the probabilities of a good stand are increased. A good plan is to divide the field into three parts. The first portion is devoted to the most forward plants in the plant bed. Then as soon as a propitious time occurs the second portion is set, and finally the third and remaining part of the field. This arrangement provides against any of the plants being harvested either too early or too late.

In an ordinary season the planter can tell within the first day or two what hills will need replanting, and to supply such he should have in reserve a quantity of thrifty plants. All plants that do not revive promptly, or are weak or injured in setting, should be replaced with the best that are in the bed, to preserve an even stand over the field, and to have the use of the land, for the missing plants would have been all profit to the farmer. The number of the vacant hills depend upon neglect or carelessness at the first planting.

PLANTS IN THE FIELD.

Numbers of planters neglect to replace plants which are destroyed by insects or die, or which are stunted in growth, and others will replace them, but at too late a day and use inferior plants. No doubt the failure to replace is often due to the scarcity of plants, and for this reason great care should be taken to have an abundance of plants, and as soon as one is destroyed or wilts, replace it with a good, strong healthy plant at the first opportunity offered. By this means your Tobacco will mature uniformily and you will get the best results possible out of each acre. If you fail to replace plants, you will find, when you come to weigh your Tobacco, that your yield is far below what you expected and what your land should produce. A plant or two missing, at short intervals, will materially reduce the yield per acre. If you have nothing but weak, stunted plants, the refuse of your plant beds, with which to fill up the frequent voids, ten chances to one your extra care will be thrown away, as the plants may not mature before frosts occur, and, at best, yield but a very inferior Leaf, which will detract considerably from the intrinsic value of the balance of your crop. Planters should therefore bear in mind that to insure good results an

abundance of healthy plants must first be grown, and then all stunted or diseased plants or voids must be filled up and replaced with promptness by the healthiest plants it is possible to secure. Besides your land should be free from all insect germs. Droughts, and violent storms cause destruction, but they are not to be dreaded any more than the pestiferous fly or worm, which, if unchecked in their march, inflict greater injury in one day to a crop than would result from ten days of drought, or the most violent storm.—Western Tobacco Journal.

CULTIVATION.

There is no great experience required for the proper cultivation of the tobacco field, and the grower may leave it all to his farm hand to do, only regulating the quantity of tobacco that he puts out by the time that can be spared from plowing and attention to other crops.

The plant does not require much hill, but rather a good body of soil between the rows that will hold moisture, and made rich with food for the roots that spread through it just under the surface. If the soil be nicely pulverized, work with the cultivator may be postponed for two or three weeks after planting, but great benefit would be found from going over the field pulling by hand whatever weeds are found around the plants, and using the hoe to lighten the soil and cut down all the weeds between the rows. When the plants are well rooted then work with the cultivators must begin, each time going a little farther from the plant and not so deep, as the plants increase in size. It will be noticed as the growth progresses that when the soil is disturbed too close to a plant the leaves on that side will wilt. Surface cultivation is all that is required, but should be kept up as long as it is possible for horse and man to pass between the rows without injury to the spreading leaves. Grass and weeds must be kept down that all nourishment may go to the plant, weeds being the signals of careless cultivation. On one farm the land may be only drawn upon for food for the crops, while on the next moisture and nourishment must be furnished to waving weeds and starved plants. The utter waste of weeds is always clearly shown in a dry season. It will pay to give the crop special attention during the growing season. Keep the field free of weeds and do not let the surface of the ground become crusted. Shallow cultivation will prevent both, although it may be necessary to use the hoe to keep the weeds from close around the young plants. Pulverize the clods and hoe down the ridges.

The more frequently the field is gone over the less likely are the worms to bother or the grass to annoy. Let the latter get no foothold, and the field will be better for it the entire season through. But in all events the worms must be kept out, even if it requires that the field shall be gone over every other day. The worm begins to feed as soon as it emerges from the shell, and grows and increases in size so rapidly that it soon becomes a formidable enemy to the farmer, and if not destroyed will soon cut the plant in shreds, and, not content with spoiling one

plant alone, will visit and demolish several more before entering the earth and becoming a chrysalis.

HEALTHY PLANTS.

Set good healthy plants, and in two to four days cultivate deeply, once in a row, without disturbing the ridge; cultivate again after the first rain. When the plants are well rooted, loosen the soil lightly around the plants to break the crust and destroy the weeds. Keep the soil loose between the rows, and when the plants are about one and one-half feet high, use a horse-hoe that will place the fine soil upon the side and edge of the ridge. A simple attachment made with two barrel staves in the shape of a V placed underneath a common cultivator will answer the purpose. Very little hand-hoeing is necessary. In about one week place more soil around the plant to keep erect. This variety of tobacco is very liable to tip over before it is topped, and when it does it should be set up at once; the sooner it is done the less the damage. It should be topped so low that the leaves will be about as large as any upon the plant when all are ripe. I am aware a wide difference of opinion exists as to how much it pays to sucker tobacco, but it should be suckered once about half way down, and again clean, for the simple reason that suckers suck the juice absolutely necessary to perfect the leaves, hence the name suckers. A perfect crop cannot be obtained unless the suckers are removed, besides it is less liable to pole sweat and damage from fat stems and tearing. Tobacco should not be cut until it is thoroughly ripe. The practice of cutting a little green to obtain a darker color is wrong; it should be fully matured, and if allowed to stand a few days after it is suckered clean, more weight and better quality is obtained. Havana Seed usually requires four weeks or more to ripen after topping, the slower and darker it can be cured the better. Tobacco should be taken down only when in just the right condition. When stripped the butts should be kept even and the leaves tied with two strings in neat bundles of from ten to fifteen pounds each.—New England Homestead.

TOPPING.

The good judgement of the grower must be carefully exercised as to time and manner of topping, as he alone can decide when his crop is ready, and mistakes will be found expensive. One portion of a field may be ready to top and the remainder may come in a week later; this is what is planned in planting, so that it will not ripen at once. The plant itself will show you when to top. Top when it is in the bud, not waiting for the blossom to appear, for strength and nourishment that should aid in maturing the upper leaves of the plant will be spent in the blossoms. By judicious topping the grower holds for the top leaves all nourishing power of the roots, thus driving to maturity the more backward portion of the plant, giving even quality to upper and lower leaves.

How to top is to be determined by the probability for maturing,

which depends upon the condition of the plant, fertility of the soil and the season. The temptation to top high comes from the hope of gaining weight, but this is where the greater number of mistakes are made. If the season has been such that topping could be done early, then more leaves will mature than if the season were backward. Again, from the quality of soil, one field may properly mature sixteen or eighteen leaves to the stalk, while in another field eight or ten leaves may exhaust the soil. Low topping produces larger leaves, more body and firmness, more weight, with less labor, and, ripening earlier, escapes the frost.

A grower urges that to give the plant the proper "spread" close attention be given to topping; that it be done when the seed buds show, and that as many leaves should be left on the stalk as the grower thinks from the quality of soil and condition of the plant will mature. Proper topping throws the strength of the plant to the leaves, developing the top leaves to ripen with the lower ones, giving even quality and merit to the crop. After topping he says, look out for suckers, pluck them off at first sight, to give all benefit to the top leaves. Attention of this kind will show great results immediately after the crop is hung in the shed. He thinks the quality of all leaf is improved after topping in proportion to nourishment given. Therefore, no strength must be wasted in buds or suckers. The life of the upper leaves is cut off by the stalk maturing below, but if the plant has been topped in time all will ripen alike.

The question of topping is next in order and, as it is one of the most delicate and most important with which the planter has to deal, the subject is worthy of the most careful consideration.

You will readily admit that the object in topping is to attain size and uniformity in the leaf, but this process is so intimately connected with that of cutting that the latter must be held constantly in view if the work is to be performed intelligently and successfully. The question is, how and when to top. The answer depends largely upon the variety of tobacco, and in no small degree upon the condition of the crop, the soil and the season. Let us first consider Havana Seed and the Hybrids. If you are accustomed to Seed-leaf and have had no experience with new varieties you will have need to remember that those new-comers are quick growers and that appearances, compared with Seed-leaf, will prove deceptive unless this fact is faithfully regarded. For instance; Havana Seed makes very little show in the field, as compared with Seedleaf, when it is ready to top. The plant literally "makes itself" after topping. If the soil and season are favorable and the growth in the twelve to fourteen days intervening between topping and cutting will be surprising. For this reason the planter accustomed to seedleaf is apt to top too late and too high. The safe rule is to top, fourteen to eighteen leaves, as soon as the bud can easily be reached. If the bud is allowed to project very high a large

wound is inflicted in topping and the plant is actually bled. Bear this in mind, if you make any mistake at topping it will likely be in the direction of late and high topping. It is rare to hear of a crop injured by early and low topping. The exact number of leaves to be left must be determined by the planter. If too many are left the spectacle of "saving at the spigot and letting run at the bung" is presented, for while the upper leaves are growing the lower ones are decaying and the planter is forced to cut at last with the top leaves half matured to make fat stems. The object is to top so that twelve to fourteen days will be sufficient to bring all of the leaves left upon the plant to a uniform degree of perfection. Now if the planter could tell in advance just what sort of weather would follow, this problem would resolve itself into simplicity itself, but as this is not possible he must top on the safe side—that is the low side. Don't wait for rain.—Bulletin.

SUCKERING.

The principal buds (one or two at the top of the plant) will start out first after topping, if left for a few days; but they are not to be allowed to make much growth—just enough so that they can be pinched out. If left to grow, they take just so much from the development of the leaves, adding nothing to the value of the plant, but rather detracting therefrom. The breaking off of these suckers, as they are called, sends the growth into the leaves, while at the same time another set of buds, one on either side of this principal one, is started out from its dormant state, and principal buds lower down on the plant also begin to grow, all of which must be broken off as soon as they come to a size sufficient to be pinched out with thumb and finger.

By the time the tobacco is fully ripe the buds have started the whole length of the main stem, some of the upper ones having started a second or third set of suckers, from dormant buds. If any of these are allowed to get large, they are difficult to remove by breaking, often damaging the leaves, even to breaking them off the plant; if not thus bad, often the break leaves a bad wound in the main stalk above the leaf petiole, which hold water caught from rains, causing a rot to set in; also, when topping the stalk they should be broken or cut, with a clean break, or like results occur to the stalk, causing the leaf at the top to fall off, or be otherwise injured.

Some few years since I noticed an article, "Secret Remedy," advertised, pretending to be an antidote to suckering Tobacco, preventing the growth of suckers; but as I never saw it applied, or where it had been applied, I am unable to say what it or its effects might be; but from what little knowledge I have of nature and natural laws, in regard to the growth of suckers on Tobacco, I should think that anything applied, as this was recommended to be, it would prove instead of a benefit, a real damage, aside from the labor of applying it, which would not be inconsiderable, as it was to be applied at the axil of each leaf where suckers would naturally grow. As the thing never found much favor

among practical growers, it soon went the way of many other humbugs.

Nothing, probably, can be made an economical substitute for hand labor in suckering Tobacco, disagreeable as it is—especially on a hot day with a somewhat humid atmosphere. Few can withstand the effects of breathing the air of a Tobacco field on such a day with their heads, as they naturally have to be, bent over and among the plants, especially when suckering is necessarily low down on the plant, just before cutting. Even the most inveterate chewer of the weed I have seen acting as if he would like to get rid of something which did not lie easy after dinner.

All the time of topping, suckering, etc., we must be on the lookout for the green worms, and the eggs which produce them, as both will sometimes be found on the same plant—oftentimes you will overlook the young ones, as they are exceedingly small, scarcely half an inch long, and no larger through than a fine cambric needle. Although one of this size will do but little present damage, that little always shows, and as they grower larger rapidly, they in short time are capable of destroying the larger part of a full grown plant by eating into the leaves, often going from one to another. The case being such, too much stress cannot be laid upon keeping the crop free of the green worm, neither can there be too much vigilance in keeping the crop free of weeds, the ground loose and mellow around the plants, from the time they begin to grow till they arrive at maturity. Thorough, careful culture is the rule, not the exception, in growing a good and successful crop of wrapper leaf Tobacco.

INJURIOUS INSECTS.

There are a few insects which cause us much trouble in our Tobacco, sometimes injuring growth and quality, one or two of which I shall here notice. The first and most injurious I will notice is the "green worm," larvæ of the "sphinx quinquemaculata" this species is our "Tobacco worm." In the south it is "sphinx Carolina." The two sphinxes so nearly resemble each other that they are sometimes confounded by cultivators. While both kinds may be found in the middle section, the true Tobacco worm larvæ of South Carolina is only found in the south, and the "sphinx quinquemaculata" is the Northern species. The larvæ of these sphinxes are very destructive to the growing Tobacco unless they are closely watched and destroyed.

With us I have noticed a hornet or yellow wasp which destroyed the young larvæ of the moth; the same has been observed in other sections and reported. In a somewhat lengthy article on "wasps and their habits," in the American Entomologist, is embodied an article, contributed by Mr. A. Fendler of Missouri, to the Gardners' Monthly, in which he states that he found hornets and orange colored wasps busy from morning till night during the months of July and August searching out the worms, and when one is found they roll it into a small ball

and carry it off; so faithfully did these wasps work that they kept the Tobacco quite clean of worms till the approach of cooler weather in September; and that some seasons these wasps seemed less numerous than others, and that when the most plenty the labor of worming was very much less then when few were observed to aid in destroying the worms. This agrees with my own and others' observations in the Connecticut river valley in regard to these hornets and wasps destroying the young larvæ of S. quinquemeculata, which here works almost exclusively on Tobacco, although an occasional one is found on potatoe vines or tomato plants.

These wasps are unable to carry off the worms after they have attained the size of above one inch or so in length, and it is mainly after they attain this size that they are the most destructive. The green worm does not come on to injure the crop until some growth of plant is made, and only end their work of destruction after the plants are hung in the curing barn, if allowed to remain without destroying them. The eggs which produce these worms are laid on the under side of the leaves, singly, and are only found by close observation, as they are nearly the same color of the leaf, of oval shape, and about the size of a small pin's head; they should be looked out for and destroyed, for they hatch out in a few days, and immediately commence to eat away the leaf, making minute round holes in the leaf at first; but they grow fast, molting often, and with increase in growth their eating increases, while they move from one place to another. I have known a single worm, when nearly full grown, to eat a third, or more, of a good sized leaf in a few hours. After attaining full growth, they remain a day or two inactive—sort of stupid, after which they bore into the ground, burrowing therein, and there pass into the chrysalid state, from which they emerge a perfect moth the following spring or early summer. When the moths are full grown they measure, with spread wings, five or six inches; length of body, from head, two inches or a little over; their trunk, or tongue, which at rest is coiled watch-spring fashion, is four or five inches long, to facilitate gathering their food from deep and trumpet shaped flowers, which they seem fond of visiting, which habit is often taken advantage of in poisoning them by placing some poisonous solution in the flowers or by striking them down and killing.

The color of the moth is a dusty brown, with five orange colored spots on each side of its body, wings double. In common with the moth tribe they fly principally at night, laying their eggs and sipping their food deep down from trumpet and cup shaped flowers. I have often seen them visiting a bed of petunias close beside the door during twilight, and they have sometimes entered the house through an open door or window.

Grasshoppers and crickets also eat the leaves on the outer edges of the field, giving them a ragged appearance and spoiling them for wrappers, but this damage seems confined to a few of the outer rows.

The principal reliance for defense must ever be vigilance and constant destruction by careful hand picking and destroying.

CUTTING.

The upper leaves of the plant will mature rapidly after topping as by proper suckering the whole power of the plant has been so directed. Greater care is then necessary to be exercised in working about the plants that are growing brittle as they so mature. It will pay to thus carefully go through the field, worming and straightening any leaves to their natural positions that may have been turned up by the wind, for the exposure of the under side injures in color and quality.

We believe that the quality of a crop of tobacco, of whatever variety may be wholly controlled by the grower, whether it be a wet season or dry season, early or late. In judicious topping he holds for the top leaves all nourishing power of the roots, thus driving to maturity the more backward portion of the plant. This gives even quality to the upper and lower leaves for wrappers. By cutting at the proper time, the grower holds the quality for curing. Therefore, the good judgement of the farmer shown in the selection of seed, in sowing, transplanting and cultivation, must be continued through topping, cutting and curing. He alone can decide the proper time for cutting his crop. Topping is done as aid in maturing; cutting when that uniformity is accomplished. At this stage—cut, for no advance must be allowed to curing while the stock is standing, nor does it do to cut green. A poor crop intelligently worked in cutting and curing, will prove much more profitable than a good crop neglected.

Cutting should not be done in the hot portion of the day, for the tendency is to sunburn rather than the desirable even wilting of the plant. If all other conditions are favorable, the very best time to cut is after two o'clock in the afternoon, but even then only so much as can be safely housed or hung on the scaffold that day. It should not be piled in any great bulk for a long haul to the barn, as the life for anything but fillers would be quickly smothered out of it.

The plant should never be cut when damp from dew or rain; and after a dashing rain, or even a succession of drizzles that wash the leaves, if possible, the crop should stand in the field for two or three days. Rain will wash away much of the gummy matter that coats the leaf and gives it substance and weight, and the quantity of water that the broad leaves take up will seriously effect the quality. If the crop is not too ripe the leaves will recover their natural condition if left to stand a day or two after a rain.

The plants must never be taken wet into the shed, for pole rot or musty tobacco is sure to be the result. In wet or dry weather if the plants are to be left in the barn unhung over night, they should be spread out singly for air. Unless rain threatens, it were better to let the plants lie in the field over night rather than pile them up any

where, for in one warm night a crop may be smothered.

In all varieties of cigar leaf the quality may easily be affected by being left standing even a day too long after the plant is matured; light colors will surely be the result of late cutting and even more serious lowering in quality is endangered.

Mr. H. S. Pomeroy, a grower of experience, gives the following hints on harvesting. The harvesting is usually done with a knife made for the purpose. A broken hoe blade is cut into from the eye down, and these will make two knives. Drill two holes near the upper edge of each piece. Saw a scarf in the large end of a buggy spoke, or other piece of hard wood, insert the hoe blade and fasten with rivets. A broken saw blade or other piece of thin steel may be used instead of the hoe blade. A knife made in this way is better than a hatchet, as it does not jar the plant and break off the leaves. Cut close to the ground so that no leaves remain on the stub, and lay carefully on the ground, keeping the leaves straight. When wilted just enough to handle without breaking, put four rows of plants in a row of piles, and from twenty to thirty plants in a pile. The sticking horse is made of a piece of two by four seven feet long, with two legs at one end, three feet and eight inches long, made of fencing. Make a mortice at upper end of two by four three inches deep, to insert the end of lath. A tin spud with iron point is slipped on the other end of the lath, and you are now ready for sticking. In large tobacco put five or six plants, evenly distributed on each lath. In small tobacco put on more but do not crowd. To haul to the shed use a rack fitted to the wagon, sixteen or eighteen feet long and three feet and eight inches wide at the top, and four feet high. Commence loading at one end, and press the lath close together till the rack is full. A man standing on top of this rack can pass the tobacco to the man hanging as high as the fourth tier or story in the shed. Hang the lath about seven inches apart. Small tobacco can be hung closer, and very large not so close. When cutting if the day be hot and clear, no tobacco should be left in the field during the middle of the day, as it would sun-burn. At such times cut in the morning, after the dew is off, only what can be taken to the shed before dinner. In the afternoon it may not do to commence cutting until three or even four o'clock. A part of this may be left out over night in piles, to be got in the next morning, if there is no danger of rain. Tobacco in snug piles is not damaged much by a light shower, but a heavy rain washes the soil out and into the leaves and nearly spoils them. Never leave tobacco long in piles if it was piled when hot, as it will heat or coddle as it is called.

### WHEN IS TOBACCO FIT TO CUT.

There is two signs that indicate when Tobacco is fit to cut. The leaf on close examination appears mottled with spots of a lighter green, approaching to orange. Second, the veinlets on being bent between the thumb and finger, breaks off with an audible snap. Tobacco that

shows both of these signs should be cut at once. Many good growers think that the first appearance of the mottled leaf indicates the proper time for cutting. Tobacco that shows both of these signs should certainly be cut at once. Before the plants are cut they should be "wormed" and "suckered" carefully. There is a right way to do the suckering. The shoots should not be broken off, leaving a stem one or more inches long in the axils of the leaves, but they should be broken out, close down to the stalk. If a stem is left, the leaves in curing become folded close around it, so that it is nearly impossible to take them off in stripping without tearing them more or less. The suckers should be picked out clear down to the lower leaves. In sultry weather it is unsafe to leave a load of Tobacco on the wagon over night, as it is liable to damage from heating. The best way to manage loose leaves, is to slip the stems of one or two behind a plant after it is hung on the pole. The weight of the plant will hold them in place, and they will cure out as well as the leaves that are not detached.

### THE SHED OR BARN.

Various styles of sheds or barns are used for curing tobacco. If economy is desired, the shed known as scantling shed, is the best and cheapest. This shed is twenty-eight feet wide and three and a half tiers high. Each bent consists of two pieces of two by four, fourteen feet long for outside posts, two pieces two by four, eighteen feet long for purlin posts, and one piece four by twenty feet long for center posts. Seven pieces of fourteen feet fencing are required for each bent for hangers, on which the ends of the lath rest. These hangers are nailed to the posts except the two for bottom tier, which should be arranged to slip out while hanging, and thus make two drive-ways, lengthwise through the middle of shed. The outside and middle posts are put perpendicular and the purlins are slanted. The bottoms of purlins are put two feet from outside posts, and their tops are about six feet from center posts. This is to leave room for drive-ways through shed. Put the bents three feet, ten inches apart and build as many bents as you require. Build foundation of blocks fourteen to sixteen inches high for ventilation at bottom. Stay the shed by braces of fencing or scantling, and cover with sixteen feet boards.

A frame shed of the same dimensions, but with center posts twenty-two feet long, having posts of six by six and fourteen feet bents, covered with shingle roof, and large double doors for each bent, so as to drive crosswise through each bent, makes one of the best sheds now in use. Sheds with shingle roofs should have ventilators in roof, and a space for ventilation at the bottom of shed. For hangers use poles or two by six scantling. In a shed of these dimensions, twenty-one feet in length is sufficient for an acre of good sized tobacco. Some hang thicker, but often loose by doing so. As soon as tobacco is in the shed, look out for shed-burn. New raisers are often misled by the term shed-burn. They think if the tobacco is burning it should be hot. Such is

not the case. It is usually cool and damp. It is not properly a burn but a rot. If it is burning or rotting, you notice a strong tobacco smell when on the side of the shed opposite the wind. If the suckers on the butts are turned up and growing, and look white, it is a pretty sure sign of shed-burn. If the weather is warm and close, tobacco may shed-burn, even though there is no rain. When it is found that tobacco is shed-burning, ventilate the shed as much as possible, when the weather will permit, but do not let the wind whip the tobacco. If the weather is very dry, so that what is cured does not feel damp, keep the shed closed as tight as you can. If the weather gets very cold before all the leaves and stems are cured, the green portion will freeze, causing what is known as fat stems.

TO BUILD A TOBACCO SHED.

In answer to questions as how to build a tobacco shed, we would say there are various ways to build and ventilate a shed, each one having some merit. Probably as good, if not the best way, is the latest Pennsylvania shed which is constructed on the following general plan: In the first place a cellar is built under the whole shed, the walls being built so that the first floor of the shed will be a trifle over three feet above the ground. Part of this cellar is divided off and a floor put down to be used as a stripping and assorting room. The rest is used as a damp and dark cellar in which the tobacco is hung after being taken from the poles. This puts it in a splendid condition for stripping. The shed is built on these cellar walls with a doorway at either end to drive in and out of. Ventilators are placed on the roof of the shed, one, two or three, according to the size of the shed. At the bottom of the shed, on all sides, doors three feet wide open from the floor, the hinges being placed on the upper edge, the doors swinging up. These doors are never less than three feet wide. Then between the tiers there are small doors, ten inches wide, hung in the same manner. In addition to the ventilators on the roof, frequently ventilators are placed in the gables also. These ventilators above and also the upper doors, are controlled from below by means of cords and pulleys. These doors between the tiers are only open on very close and sultry days, when there is danger of burn. The wide opening at the bottom, (below where any of the tobacco is hung, so that the wind cannot whip it and damage it,) with the ventilators on the roof give an excellent circulation of air through the shed, a better and more uniform temperature can be kept, and the tobacco cures down with a better color, and the shed is much easier to handle. This describes, in a very general way, what is considered, in Pennsylvania, the best and most practical shed for the curing of tobacco. The putting of the tobacco in a damp cellar after it is taken down from the poles, keeps it in fine condition for handling at any and all times.

HOW TO BUILD A SHED FOR CIGAR LEAF.

In speaking of the construction of a Tobacco shed or barn, an ex-

change says:

From experience and information we gather from exchanges, we say: A shed twenty-eight feet wide, fourteen feet high, and long enough to accommodate the crop raised, twenty-four feet being long enough to hold one acre, the bents being twelve feet each. Commencing at the plates, the tiers should be four feet and three inches apart; this will give a wide space at the bottom for ventilation. Commencing at the outside to hang the Tobacco, will leave a space in the middle of about three feet up through the shed for the air to pass. The shed should be boarded horizontally or around the building. At the bottom of the shed, on all sides, doors should open from the ground, the hinges being placed on the upper edge, the doors swinging up. These doors should be three feet wide, and between the tiers there should be small doors ten inches wide hung in the same manner. Ventilators are placed on the roof, one in each bent and gable. The doors between the tiers are open when the Tobacco is first put in, and on very close and sultry days, when there is danger of burn, the wide opening at bottom should be below where any of the Tobacco is hung, so that the wind can not whip and damage it.

With the ventilators open in the roof it gives an excellent circulation of air through the entire shed, a better and more uniform temperature is kept, and the Tobacco cures down with a better color and the shed is much easier to handle. Immediately after hanging, the Tobacco should have as much ventilation as possible for the first week or ten days, or until the leaves become thoroughly yellowed, and the ventilation should be given in such a way that the wind will not bruise the leaves. After the plant has become thoroughly yellowed care must be taken that it does not cure too fast. This may be prevented by closing the ventilators, as Tobacco cures by evaporation, and a shed built in this way can be more easily controlled than a shed with perpendicular doors, and with such horizontal ventilation as we have described. The shed could be built tight, boarded with strip lath, and avoid weather-beaten Tobacco. The driveway can be arranged to drive lengthways. It is very important to have a tight roof. In Pennsylvania a cellar is built under the whole shed, the walls being built so that the first floor will be about three feet above the ground. Part of this cellar is partitioned off and a floor put in; this room is used for stripping and assorting, the rest is a damp, dark cellar, which is used for storing the Tobacco after stripping, which keeps it in splendid condition for assorting.

Mr. Geo. W. Price, a builder of a great many tobacco sheds, furnishes the following lumber bill for a regular barn shed having a capacity for five acres. Size of shed 28x70 feet, 18 feet posts. Six pieces 6x8, twenty-eight feet long; eighteen pieces 6x8, eighteen feet long; six pieces 6x6, twenty-eight feet long; six pieces 6x6, twenty-four feet long; three pieces 6x6, twenty-six feet long; sixteen pieces 4x6, fourteen feet long;

twenty pieces 4x4, fourteen feet long ; seventy-two pieces 2x6, eighteen feet long ; 4,000 feet dimension boards, eighteen feet long ; 2,500 feet roof boards, sixteen feet long ; twenty thousand shingles ; 175 pieces, hangers 2x6, fourteen long.

### CURING TOBACCO.

An important and exceedingly interesting feature in handling tobacco is the process of curing, and it is one which calls for the exercise of the best judgement of the planter, and will readily yield him the desired result for intelligent application of approved modes and principles. Experience shows that abuse of these fixed rules as quickly results in injury and degradition of the crop. In the curing the planter is to get out of the crop whatever of profits he is to have on his money and labor put in ; therefore after the tobacco is safely hanging in the sheds, increased care and watchfulness are necessary, and the best approved rules are to be followed.

The Dayton (Ohio) Journal urges that an even curing of a crop can only be had by a steady process that must not be checked, and to retain quality and obtain desirable color, should not be too rapid. That curing may be in perfect control of the grower, everything ordinarily depending upon ventilation. The Journal further says that the best authorities agree that when the weather is cool and damp the sheds should be left open, with no danger that the curing will be too fast, and that free circulation then will go far in securing dark colors. Of course, it is understood that the ventilators are to be kept open in fair weather until the curing is quite completed, making sure that the top leaves may dry out and green ones cure before freezing cold weather comes, always having caution against pole sweat and shed burn. When the crop is well cured down, except the stems, it is recommended that the doors be opened during moderate rain, as the color will be improved by moisture. The grower using his judgement as to the necessity for control of the temperature of the shed, may build pit fires in the ground floor, but the smoke should not pass through the tobacco. A covered flue could be made along the ground through the centre of the shed to a pipe or chimney at the end. A better plan, however, would be to have the fires in stoves, with pipe passing through the shed from end to end, the more pipe the better. A steam boiler may be located in the shed, but the heating must be done by coils of pipe, as steam direct would greatly injure the tobacco.

In hot, sultry damp weather, when there is no air stirring, the sheds must be closed tighly, and to prevent pole sweat, it may be necessary to start the fires, for if such murky weather continues long, the stems are liable to rot.

Leaf tobacco will cure down rapidly in extreme dry, windy weather, therefore the effort in such dry season must be to retard this drying out, so that even curing may slowly and regularly progress. The doors and ventilators are to be kept closed, a number of tubs of water should

be placed in the shed, or the floor be thoroughly saturated with water, and the operation be often repeated while the dry spell shall continue, the farmer making frequent examination of crop to see that the air in the shed is not too damp and soggy, that the leaves do not become so moist as to entirely stop the process of curing, the desire being only to secure cool, damp atmosphere.

Ventilators and doors of sheds should be closed during a storm, but again opened as soon as it has passed. Winds do damage by cracking the leaves, and carrying in dust. Cattle and poultry should also be shut out.

With open sheds the tobacco is entirely exposed to the changes of weather, now damp and soggy, then dry and dusty, the strength and merit of the crop being thus wasted. Such sheds are but little improvement over the pioneer way of hanging tobacco in beech trees. The rickety old sheds are but monuments of the ignorance and slovenliness of the owner, and evidence of poverty-stricken crops that it is best to shun. What is left of such trashy crops after storms have blown through and heat dried out, becomes gritty with dust and poultry manure, and foul with rot.

It is not necessary that fine tobacco barns be built, but every grower should have a weather proof shed, or quit.

A writer in the Wisconsin Tobacco Reporter says: "It is pertty certain that the weather has much to do with curing. It is well known that, in some season, the tobacco in a certain section will rule light in color, while in another year dark colors will prevail, and at other times heavey losses result from pole burning. These variations of quality probably result from the general character of the weather during the process of curing, and serve to indicate laws which rarely fail. These are that rapid curing tends to produce light colors, and slow curing dark colors. With the light colors there is likely to be other undesirable qualities, such as rust, white veins, poor texture, etc. It is generally believed that very rapid drying tends to produce undesirable qualities in the cured leaf, and therefore the curing barn should be so arranged as to prevent rapid curing during dry weather. In damp, murky weather there is also danger from pole burn while the tobacco is green and care must be exercised to prevent this.

"Right here is a point where a difference in opinion occurs. It is my practice to keep the ventilating doors of the curing barn open during hot, lowry, damp weather, so as to encourage a circulation of air among the plants. There are good growers who follow the reverse course, and keep all doors closed during periods of damp weather, whether the weather is damp or cool, their argument being that, by keeping the building tight, the hot, damp air is excluded. Which of these opinions is right I do not know, but it is pretty certain that a certain degree of heat and dampness will affect tobacco seriously, whether the doors are opened or closed, and for this reason few or no

growers are exempt from damage to their tobacco from pole sweats. The best advice that I can give on this subject is to keep the curing barn closed tightly during the periods of dry, windy weather, and to encourage a free circulation of air during damp weather."

The American Cultivator attributes pole sweating to hot, sultry, damp weather. When moisture collects on the hanging plants, and remains there without a sufficient wind to dry it off, then we expect and look for pole sweating, and, if of long continuance, oftentimes stem rot is found. The rain will be of great benefit to late pieces of tobacco, where but recently topped. We think, if the frosts do not interfere, that the late set plants, where the plant has not ceased to grow, will be greatly benefitted by a rapid growth, as well as by helping to mature the plants.

Says the Maimsburg Bulletin: Anybody can dry tobacco, but curing is a process requiring intelligent supervision. The whole secret of successful curing is comprehended in the slow and uniform evaporation of the juices of the plant. The elements involved in this delicate change are light, air, heat and moisture. It is rare indeed that the curing season throughout continues so favorable as to relieve the planter of all responsibility in the management of the elements that affect his crop in the shed, but if the methods heretofore presented to the growers have found favor among them they are now in position to take advantage of the vicissitudes of the season and reduce the work in curing to a minium.

Closed sheds, with openings only around the bottom and under the eaves, exclude the tobacco miller that bores the leaf, the light that bleaches it, the storms that pelt and the wind that whips it, while at the same time it establishes a circulation of air, to be attained so perfectly by no other means, and permits the planter to control the conditions necessary to perfect curing. The application of water to the ground under the sheds in protracted drought, and burning fires in pits when the weather is extremely wet, are means that the intelligent planter will not neglect to maintain the conditions necessary in perfect curing which, in this day, is a positive, unvarying, systematic process, and not a question of chance at all.

### SHED BURNING.

Some seasons this cannot be avoided. We have seen a single stick hanging in an open shed, injured in this way. The most of this results from crowding on the sticks, or in the tiers. It is not so much the want of drafts of air, but the pressure of one leaf or stalk against another. As the sticks are placed in the tier, the stalks should occupy its entire length and swing clear of the tier below. The idea is, to occupy all the space possible, but avoid pressure. During the process of curing give all the sun and air possible. Close up in rainy weather. Should house burning set in, it can be readily detected by the rotten, pungent smell when to the windward of the barn. We think there is no alter-

native but to let it burn. We can not advise the use of fire, because the smoke is ruinous; nor scaffolding out, for, when once in the sun the life and color seem to depart in the drying.

For fear that some may think we over-draw in the importance of good handling, we propose to give briefly the reason of our faith. We hope we may not be deemed egotistical. During the last fifteen years, besides taking more than a thousand dollars in premiums, our tobacco has averaged twenty cents per pound or more. Four years of that time it has brought twenty cents or over. Two years it has fallen below fifteen cents—the dry weather of 1881 being one of them. As poor as this crop was we gave it all the attention and care we would give the best. Our farm has no fresh fields of bluegrass or woodland pastures, but the most of the tobacco has been grown on fields that have been in alternate crops for fifty years. We give in a nutshell the principal causes of our success: Handle while fresh from the knife; scafford either in the barn or at the barn; allow no rain to fall on it, or high winds to shake it up; select into five classes; order your tobacco in your own barns; pack into hogsheads honestly; sell in August or September, after the effect of the "sweat" is determined. These have been our rules during our whole experience in tobacco growing.

We can not close without a word in behalf of the tobacco lands of our State. Other crops grow so readily after it that many farmers follow it with one or more crops of corn. The land being in a high state of cultivation, is easily washed by rains, and the difficulty of securing a stand of grass is largely increased. We sow to wheat, then to bluegrass and clover.—Ky. Grower.

### PREPARING THE CROP FOR MARKET.

Nothing is gained by selling on the poles except to be among the first sales, for the tobacco must be delivered in good condition or the grower is responsible for at least the full damage. He may as well wait until his crop is in condition to sell, especially when the supply is short. The possession of a fine crop on the poles is quite different from having sold and delivered the whole crop in good condition, for many accidents are liable to happen to it by a warm or cold sweat. Large quantities are yearly damaged by lack of knowledge of the proper condition it should be in when taken down, but more from neglect.

The sooner tobacco is taken down after the stem is cured the better. If the colors are uneven, they will become as near uniform in the pile after it is stripped as by hanging, if taken down in proper condition and kept so. Some crops will allow of a damper condition than others. Leaf of good body and strong fiber can be taken down when damper, than a thin and papery leaf. Early in the season it should not be damp as after. The only good rule to determine when it is in proper condition to take down is to clasp the leaves near the tip of the plant and squeeze tightly; when the pressure is removed and they expand in a few seconds and are stained but very little, the crop is just right to take down. It

should be watched while dampening to guard against rain driving in at the doors. If the outside plants get wet or too damp, hang them up until dried sufficiently. Make a floor of sawed poles, plank or boards laid on the ground edge to edge, and pile the plants, a small armful at a time, about two feet high. If early in the season, lap the tips about one-third the length of the plants, using only the hands to press them down. If the stalks are frozen, do not take it down until it stops dripping, as the juice will stain the leaf. The sooner it is stripped after taking down, the better, as the leaves are liable to stick to the stalk and get stained and be torn when stripped. If it is warm when taken down it will soon heat and should be examined frequently. On the first indication of heating, carefully lay the pile over, making it about one-half as high as before and lay as loose as possible. In stripping keep the butts even and free from suckers. If an occasional fat stem is found lay them on poles until cured; do not tie them. Lay the leaves straight in boxes made of planed boards seven or eight inches at the bottom and eight or nine at the top, eight inches high and three feet long. Such a box will hold bundles to weigh twelve to sixteen pounds. Press the leaves with the hands or lightly with the knees.

Making single bundles, using two strings, one about five inches from the butts, the other near the tips, but where the bundle is full size. Lay the bundles on their side and don't pile them until thoroughly cooled through. Make the platform for bundles three to six inches above the ground, of straight edged poles or plank, and cover it with paper (most any old newspaper will do). Lay the bundles tip to tip on the paper and cover the pile with paper first and then with boards. The paper keeps the tobacco clean and prevents evaporation. The outside will be in good condition however dry the weather may be. Let the butts be exposed to the air to dry or cure. When the weather becomes cold pile the bundles three or four high, choosing a mild or damp day to pile them. Examine the pile frequently, and if it begins to get warm, air the bundles thoroughly. If it should get quite warm, untie and spread them, turn them often, and don't leave them until thoroughly cooled and covered, but don't pile the bundles again for a while.—New England Homestead.

ASSORTING TOBACCO.

Assorting tobacco is so essential that a few suggestions from us in reference to the subject may not come amiss. We would suggest to assort in four qualities. Make what are called long wrappers—then short ones, and after these selections make binders, or B's; then follow the poorest grade called ordinarily fillers, or C's. The long and short wrappers should be sized, by which we mean the leaves in the respective kinds should be made the same length as near as can be. We learn that in Pennsylvania some of the growers use measures in sizing up their wrappers, and in this way they make their long and short wrappers look neatly, the leaves being of nearly the same length and

color in making up the hands. And again, there should be good sense and discrimination used in selecting the colors so that they will be about the same in each case. In other words, keep the yellowish or light colored leaves by themselves and pack them also by themselves. By doing this the assorter will be able to make the colors run even. We think some sorters have measures on their assorting tables by which they are enabled to classify their selections very accurately and preserve uniform length by so doing.

At all events, it is well to keep the lengths even of the respective kinds if one wishes to have neat and uniform looking hands. The binders—third quality—should also be selected with care and with reference to making them run uniformily the same as to size; but there is no need of being so particular about colors in selecting them, since the B's are made from an under wrapper or binder, and the colors, of course, do not show in the cigars. The B's should be cleanly and neatly assorted and should be free from unmerchantable tobacco. The fourth quality, or the fillers—in these days of high prices—are of much consequence to all concerned. When crops are brought "round," or so much per pound through, they cost the buyer just as much per pound as the higher grades in the same purchase. They should be assorted with due reference to this fact as well as with regard to having them neatly, cleanly, systematically and honestly tied and packed up. We are very glad, indeed, to know that our growers in this section at least are making marked improvements in putting up their C's, or, as the growers sometimes call them, "lugs." The tobacco should be in first-class order when it is taken down from the poles, and kept so until it goes in to the case for market. The hands as fast as made up should be taken care of at once, placed securely in the hank or cases so as not to dry out by careless exposure. When once in good order strive to keep your tobacco in that condition. Some people get nervous and take their tobacco down from the poles when it is not fit, and to all such we would say that when once in bad condition it is very difficult to get in order again. In assorting make the respective sorts good, and we think it a bad plan to make more wrappers than there really are. Make the wrappers strictly good, and the others ditto.—Baldwinsville Gazette.

From an experience of many years I believe it is best that the average tobacco grower should sell his crop in the bundle. As a rule, he is not sufficiently versed in the business to assort the crop in a proper manner. He does not fully understand the requirements of the trade. Though assorted ever so well by the growers, such tobacco will sell as farmers' packing. Again, the leaf requires to be packed at a uniform degree of moisture, at least when of the same quality. Nice discrimination is needed to secure the best results. The average farmer, who raises from one to three acres of the weed annually, probably only packs his own crop, and often this is done in a very unworkman-

like manner, thus causing considerable damage to what might otherwise, with good packing, sell for from one to three cents more per pound. Oftentimes there will be even more difference in prices. A dealer knows that much depends on the appearance of his packing. if every hand lies straight and compact and round in the box it looks well. Under the packing of experts, the boxes will be of the proper size and uniform in appearance, each box containing just so many pounds. In fact, everything will be done systematically. The farmer should also recollect that there is a loss in assorting of from two to four pounds to the 100 pounds. That the assorting properly costs about one and a half to two cents per pound, and the boxes about one-fourth of a cent per pound. So the shrinkage and labor in assorting is fully equal to two cents per pound, hence eighteen cents in the bundle is fully equal to twenty cents packed. When satisfactory prices cannot be obtained, then the farmer has to pack his crop, in which case he should do everything squarely and in a workmanlike manner. When the tobacco is tied up in bundles, short ones are the most convenient to handle. It is better to have them of pretty good size, say from fifteen to twenty pounds or even more, in weight. When the bundles are packed, care must be taken to pack them as closely and compactly as possible, to prevent their drying up. When the pile is so arranged that the leaves dry up and get broken much damage is done. And if the pile doesn't show proper care, it rather has the effect to give the dealer an unfavorable first impression.—Hill Top in American Cultivator.

### STRIPPING OF TOBACCO.

Many superstitious and erroneous notions as to the proper time for stripping are still entertained, not only by planters, but among buyers also. Planters are inclined to listen to and adopt the opinions of any man who presents himself as a buyer, though he be utterly ignorant of the scientific cultivation and care of the weed. It must be remembered, too, that buyers, as well as planters, are classed as first, second, third, fourth and fifth rate in the hair-splitting head centers of the trade. Sound advice will always commend itself to reason, or at least time will commend or condemn the claims of all "tobacco talkers" who assume to speak with authority.

We submit the following propositions:

1.—There is but one proper time to strip tobacco—all others are wrong.

2.—The proper time to strip tobacco is when the rib is cured—not sooner; nor later.

You will admit the truth of the first proposition, but with some the second may be open to doubt. Let us inquire a little further.

When tobacco is cured, it is cured, and that is end of that. If allowed to hang longer, the same elements that wrought the constructive change in the greenleaf and presented the beautiful, dark, glossy color

when cured, will continue to act. If, for any reason, you fail to move it at the critical period in any of the successive stages during the perfection of the leaf, you can never recall your opportunity.

Let the planters of tobacco lay this verity to their hearts—Tobacco never stands still! It will not wait your convenience, in the seed, in the field, or in the shed.

We hear that some ignorant persons are advising planters to leave their tobacco hang, and we are in receipt of inquires from growers of Spanish as to the proper time to strip. The talk about letting tobacco hang after the rib is cured at the butt is nothing short of nonsense. Take it down and strip it—the sooner the better. The essential oil, which gives lustre, flavor, sweating and burning quality in the leaf, is leaching out, slowly but surely, every day it is left hanging after the curing process is perfected.

Look at in this way: Suppose you let your tobacco hang two years—what would be the result? Can you imagine how it would look?

Many of you remember that tobacco left hanging in the shed too long, a few years ago, molded at the tips, and all of you are aware that tobacco was left too long last year. Crops thus treated lost twenty-five per cent of their luster and vitality, and went into the warehouses, dry, husky and in bad shape generally.

Tobacco, especially the fine grades, will require close watching from this time forth, the object being to avoid the extreme of temperature and moisture, and to preserve an equitable state. This is best accomplished in tight sheds with vaults and comfortable stripping rooms.—Bulletin.

### HOW TO TIE TOBACCO HANDS.

It used to be a custom some years ago to tie the hands of tobacco too large entirely. They are now tied much smaller. This is right. We have contended and still contend that from fifteen to twenty leaves in a hand are enough. The growth and size of the leaves, however, may make some difference in regard to the number of leaves that should be put into a hand. The suggestion, however, is a wise one that hands should not be made too large—should not be made up in a bungling and awkward manner. When the stems of the leaves are thoroughly cured out so they are dry, the leaf which is used to tie the butts, should in all cases be tied closely to the ends of the butts in order to make the hands look neatly. There is nothing like neatness and system in putting up tobacco, if one desires to find a ready market for it. A neatly assorted and handsomely tied up lot of tobacco will always command attention and sell well, provided the leaf be naturally good. It is the badly assorted and heedlessly and carelessly tied up lot that is neglected by the buyer. Only in cases of this last resort, when there are no finely assorted lots in the market to be had, does the dealer seek for the bunglingly handled parcels of tobacco. He seeks for those parcels first which are known to have been well handled in

every respect. There is much to be gained by tying the hands well. Some growers tie them one and one-half inches down from the ends of the butts, while those who wish to make their hands show a good length of leaf and carry with them "an air of neatness," tie them close to the ends of the butts, say not over one-half to three-fourths of an inch down. Then after the assorter has tied up his tobacco neatly, we think there is much to be gained in keeping the hands in good shape and first-class order. A sprawling, fan-shaped hand, always looks badly. The hand, in our opinion, should be kept in sound, straight form—and then let it be placed either in the case, if fit to be packed, or in the bank or "rank," where, if the butts are not properly cured out, the air and weather will soon effect the desired result.

After tobacco is assorted and tied up in accordance with the most approved methods, the next important thing we have to perform in respect to its care, is to see to it that it is immediately placed in a non-exposed condition, so that it will not be injured by drying out, and then become harsh and non-pliable. When once in order, we believe it ought not to be neglected. The growers of Onondaga county have a bright future before them in making this the banner county for raising fine tobacco, if they put it up beyond fair criticism.—Baldwinsville (N. Y.) Gazette.

### A BUYERS' EXPERIENCE.

Mr. Albert Tag gives the following as his experience with growers:

There is almost the same difference between different crops of tobacco as there is between a like number of men. Those who are conscientious, careful, and divide their labors between their brain and hands with honesty of purpose have invariably delivered their product in a very satisfactory shape and have not had a word, while others, who fortunately are in the small minority, thought all there was necessary after their tobacco was sold, was to throw it from the hanger on to the piles and tear off the leaves; and all the leaves, whether good or without value, walk over them, bundle the tobacco, bring it in and get their money.

These men can be easily recognized by the manner in which they keep up their farms—or rather, keep them down—by the manner in which they do everything slovenly, and these men are the most difficult to deal with. They do not want to see that their neighbor, who has given his time, attention and labor to the handling of his tobacco, is entitled to better treatment at the buyers' hands; they have the trouble and annoyance which is more laborious and disagreeable than the little extra work it would have taken to do things right in the first place. So, one who delivered his trash, sweepings and everything, bearing only the faintest semblance at having been connected, at some period with a tobacco plant, when asked, replied that he "supposed that everything that grew on the stalk was bought under the contract."

It is essential that the farmers in this neighborhood should be thoroughly posted on the handling—that is sorting their tobacco. If they once know this they will not be at a loss to know what to do with their tobacco. It is bound to happen sooner or later that they will be obliged to hold their tobacco through the summer. Those who continue the handling as poorly as they commence it, will have nothing to sell in September; and if they once know what loss of time, of weight, their carelessness occasions in the warehouses, they can no longer be excused on the plea of ignorance, but become accusable of downright dishonesty, and naturally get such a reputation that it will be a difficult matter for them to market their tobacco. The first thing to be observed with brashy, sandy leaves, is that they weigh but very little; that they deface the appearance of the whole crop in the shed; that in drying the sand drops off on to the better leaves and that they appear to be in much greater numbers than they really are, thus reducing the crop in the eyes of the prospective buyer whose experience teaches him to put but little confidence in the assurances of the grower that he will not attempt to deliver anything but what is exactly as it should be. The better plan is—cut the stalk higher up from the ground. It reduces the bulk in the shed to some extent, thus securing the better ventilation and avoid danger of pole sweat, making a clean looking crop which everybody will be anxious to secure. And should it not be practical to cut high from the ground, the poor leaves can be removed very easily hanging in the shed.

PRICE VS. CARE.

Growers claim, and in this they are supported by the trade, that the crop of 1884 when fairly handled was of unusual merit. Yet a great many are grumbling because the price is not greater. It should be remembered when this question of price is considered, that prices for tobacco are more nearly up to the standard of 1883 than any other product. Hard times and the tumble in everything has affected tobacco less than any other product of the soil. Then again, the skill and painstaking efforts of the grower affect the price more than anything else. A man don't need to be thoroughly versed in the tobacco business to see that. All that is necessary to a man of ordinary business sense is to visit a tobacco market and note the difference in the handling of tobacco by different men, and then look at the difference in price they get. It is with tobacco just as it has been with the butter business. The difference in the price is caused almost wholly by the difference in the men who produce it. There are hundreds of butter makers who are glad to get eighteen cents a pound for their butter, and right beside of them are men who are getting thirty cents. The cost of producing the poorest butter was just as great, yet a little good brains, patience and skill makes one pound worth twelve cents more than the other.

One tobacco grower cares for his tobacco as it ought to be done and handles it rightly. He puts good sense into the work every step of the way, and sells his crop from one to five cents a pound more than his neighbor, who is too smart in his own estimation to "putter around over a little tobacco." A great many men terribly hate to take a little pains; terribly hate to bestow a little care, time and attention on any given work. They seem to think it beneath their dignity to look after small things. They propose only to deal with large matters. Such men usually sell their butter for twelve cents less a pound than their neighbor, and their tobacco from one to five cents than the man who is not ashamed to "putter." A poor judgement causes poor execution, and both may be often traced to this foolish despising of the day of small things. A thorough man is one that insists on finishing a job. If it requires "puttering" or fine work, at it he goes. Tobacco raising and handling is essentially full of fine judgement and fine painstaking work. Butter making is the same. A lazy man and one of coarse judgement had better keep out of either.—Ft. Atkinson Union.

### HOW TO SAMPLE TOBACCO.

When sampling, after removing the case from the bunch, it is generally broken first about a third of the way from the bottom and two hands drawn, then about the same distance from the top of the bunch, and two or more hands taken out. Then go to the other end of the bunch, it is broken about in the middle and two more hands drawn, and from these hands thus drawn a sample of the case is made up. Now it is very evident that if all the low grade hands are packed in the centre it will not show as it should. Suppose that twenty-five or thirty hands that do not rank with the rest, but are better than No. 2, are all placed in the centre, or where the break is made, some of these hands find their way into the sample. We had better far put them on the outside of the case, where they can be plainly seen. Outside hands do not sweat as hard as those on the inside, and it is better that these should be of the poorest quality that is to be packed in the case. They are scarcely fit for wrapping cigars, unless it is resweat, and then perhaps on a cheaper article. Do not, however, infer from anything here said that we favor siding with low grade seconds. By no means; only use the kind you have made. In this you will always find the class we are speaking of. This we call packing honestly for both seller and buyer.

### SELLING.

Anybody can grow a good crop in a good season, but in periods of drought or flood the reading, thinking, enterprising planter will be found on top. If you have faithfully and intelligently observed the methods you have a fine crop and are ready to sell.

The old way of selling was to wait until your neighbor sold, see what he got, and demand the same price for your crop. The buyers soon learned to buy a poor crop to begin with, or to secure a good crop

at a low figure of some planter who was in desperate need of money, and thus established a price for a whole neighborhood.

There is such a thing as asking too much as well as too little for a crop, and as both defeat a sale one is as bad as the other.

To fairly estimate the value of a crop one must learn the purpose for which it is used, the source of supply and demand and the causes which influence them. Such information is furnished by trade papers. The intelligent planter who has read these papers carefully during the season is acquainted with the condition of crops in competing states as well as his own, and has had such facts presented to him from time to time during the year as will enable him to fix such a price upon his crop as he will be able to realize.

WISCONSIN CAN RAISE THE CIGAR WRAPPING TOBACCO FOR THE WORLD.

It may seem to many an extravagant statement but we believe nevertheless true, that to-day the profits in the culture of tobacco in Wisconsin are greater than any other state in the Union. There is a limited section in the North Carolina district producing the finest qualities of the "bright" leaf where prices rule higher than here, but the yield per acre falls far below that of our own state and the average profits much smaller. We have before us a circular of a Clarkville, Tenn., firm who quote prices on a very large proportion of Southern tobaccos, running from 4 to 12 cents and averaging not over 8 cents per pound. None of the cigar producing tobacco states have sold their '84 crop at higher prices than Wisconsin growers, while many are receiving much lower prices, while the cost of producing the crop in any of the states exceeds that of this state from 50 to 100 per cent. To go farther into details let us here present a statement produced at a club of tobacco raisers of Chemung Valley, New York, considering the cost of raising tobacco. They were men of large experience and it was decided that several processes in the cultivation should be estimated carefully by each one, and their estimates then grouped and an average struck. Here is the result of their work:

| | |
|---|---|
| Rent of land including manure, per acre | $40.00 |
| Plowing twice, harrowing and ridging, per acre | 5.00 |
| Plants, per acre | 3.00 |
| Setting plants, per acre | 3.00 |
| Re-setting, per acre | 1.50 |
| Cultivating five times, per acre | 3.75 |
| Hoeing twice, per acre | 7.00 |
| Worming, per acre | 9.00 |
| Topping, per acre | .75 |
| Suckering, per acre | 4.75 |
| Cutting and hanging, per acre | 8.00 |
| Shed room, per acre | 10.00 |
| Twine for hanging, per acre | .50 |
| Total cost up to the time of taking down | $96.25 |
| Cost of taking down, stripping, assorting, packing and casing, on a basis of 1,500 pounds per acre—about an average—at two and a half cents per pound | 37.50 |

| | |
|---|---|
| Total expenses of raising one acre | $133.75 |
| Cost per pound on a basis of 1,500 per acre | .89 |

If this estimate is worth anything, it shows that tobacco in New York State can not be grown for less than nine cents a pound. By slack cultivation and careless handling, the tobacco grower may neglect manuring one or two seasons, and produce it cheaper, at the expense of his land.

To make a proper comparison between the east and the west on tobacco raising, let us here introduce the reports of three successful Wisconsin tobacco farmers and in doing so have selected one from each of three different counties. While these reports show better average than the majority of our farmers obtain, they are not exceptional cases, and though much more startling figures could be produced these answer the purpose of comparison equally as well.

1st. Mr. H. R. Hoag, Walworth, Walworth Co., makes the following report of his '84 crop recently sold: Sixteen acres were planted and harvested producing 24,353 lbs., which was sold at 15 cents in the bundle. The total cash receipts for the crop were $3,651.45. The cost of growing and marketing the crop, every item of expense included, was $65.20. The gross cash return per acre was $228.15, leaving a net profit of $162.95. The cost per pound to raise this crop was four and two-tenths cents per pound.

2nd. Mr. Ed Corcoran, of Dunkirk, Dane county, grew a field of seven and a half acres which yielded 12,512 pounds or 1,668 pounds per acre. The crop brought $2,064.48 or $275.26 for each acre of the field. The price obtained was sixteen and a half cents per pound. Mr. Corcoran enjoys the reputation of being a most careful grower, putting an unusual amount of labor and expense upon his crop. This he estimates to be $75 per acre or four and three tenth cents per pound.

3rd. Mr. John A. Decker, residing near Janesville, Rock Co., from eleven acres of tobacco grown by him the past season and sold at eighteen cents per pound, received $2,834.28, a yield of $267.66 per acre. Estimating interest on his farm at $500 per acre and manures purchased in Janesville at high figures and every other expense that entered into the cost of his crop, he figures the total at $75.00 per acre. In the way of supplement we might add that Mr. Decker's farm consists of seventeen and a half acres, including streets and buildings, and from this place during the season has received in cash $3,367.54. We are also prompted here to ask the question, how many farms think there are in the state controlled by one man that can show receipts equal to this report? Is there another seventeen acre farm that can approach it? While the three cases above recited show cash receipts greater than the average tobacco farmer, they also show the cost of producing greater than the average. If Mr. Decker can grow tobacco on land valued at $500 per acre, purchase his manures in a high market, and show figures that places the cost below $75.00 per

acre, we are led to believe that the average farmer whose land is valued at $50 and less per acre, and who produces his own manures at a nominal cost, can reduce the cost far below this figure, varying perhaps, from 3 to 4 cents per pound. It is quite generally conceded, we think that a very large porportion of the tobacco of this state is produced at a cost not to exceed $50 per acre, and in some instances the expense is reduced to even $30 per acre. Compare this with the table first presented showing the cost in New York and other eastern states, and it can readily be seen what advantage Wisconsin tobacco growers really have over eastern competitors. From a recent issue of a Lancaster, Pa., paper, we clip the following which fully substantiates the position taken on the point:

"Wisconsin has advantages over her eastern competitors that stand her in good stead. Her soil is deep, rich. Lancaster county farmers often put more money on an acre of tobacco in the shape of manure alone than it costs the average Wisconsin farmer to grow an acre. His land does not cost more than one-half what ours does, and in these two items alone he has advantages we here cannot overcome. When, therefore, the frosts of spring cease early and remain away until late in the fall the Wisconsin tobacco growers can undersell us. But other things may arise at any time to change all this and place our own growers more on an equality with the western ones."

Wisconsin tobacco growers accept the situation cheerfully and take their chances upon any condition of things that is liable to change its inequality.

### COST OF GROWING TOBACCO IN ILLINOIS.

James Ritzell, of Nora township, an experienced and successful grower has furnished the cost in labor of growing twelve acres of tobacco The estimated cost per day was the price paid for extra labor hired, except in stripping and setting a small per cent. was hired for less than the amount estimated. Manual labor at $1.00 per day and $2.50 per week for board, and team work at $1.25 per day including board. Mr. Ritzell informs us he has always raised 1,000 pounds or more per acre.

LABOR FOR MAN.

| | | |
|---|---|---|
| 2 | days preparing seed bed | $ 2 00 |
| 10 | days wedding plants | 10 00 |
| 10 | days hauling manure | 10 00 |
| 7 | days plowing ground | 7 00 |
| 5 | days harrowing, marking, preparing | 5 00 |
| 29 | days setting plants | 29 00 |
| 17½ | days cultivating | 17 50 |
| 9½ | days hoeing | 9 50 |
| 8½ | days topping and worming | 8 50 |
| 68½ | days harvestjng | 68 50 |
| 41 | days taking down, stripping, and baleing | 41 00 |
| 8 | days hauling to market | 8 00 |
| 216 | days manual labor | $ 216 00 |

LABOR FOR TEAM.

| | | |
|---|---|---|
| 8 | days hauling manure | $ 10 00 |
| 7 | days plowing | 8 75 |
| 5 | days harrowing, marking, preparing | 6 20 |
| 13 | days cultivation | 16 25 |
| 11½ | days harvesting | 14 37 |
| 8 | days hauling to market | 10 00 |
| 52½ | days for team work | $ 65 62 |
| 34⅓ | weeks' board | 85 83 |
| | Total | $ 367 45 |
| | Cost of labor per acre | 30 62 |
| Received for 12,500 pounds of tobacco at 10 cents per pound | | $ 1,250 00 |
| Cost of labor and board | | 367 45 |
| | Total, net | $ 882 55 |
| | Net per acre | 73 54 |

Rent of land, cost of manure, and rent of shed to be taken from $73.54 per acre, will give the net income of the crop. We think the shed as a shelter for stock will pay a good interest on the investment, and the manure will give quicker returns used on a tobacco crop than any other. Everyone can draw their own conclusion.

PROSPECTS OF AN OVER PRODUCTION OF THE TOBACCO CROP.

Doubtless many of the readers of this Pamphlet have often been tempted to ask this question: If tobacco growing is really as profitable as the figures often presented in these columns would seem to indicate, will not the farmers throughout the whole state and northwest rush into tobacco, and will there not be an over production and prices drop to an unprofitable figure. There are several reasons why we think there is no immediate danger of such a calamity, some of which we will present.

1st. Wisconsin tobacco has an excellent reputation. Manufacturers have learned that it is the best cigar-wrapping tobacco grown, and the trade consequently must buy it. It has one virtue which no other state tobacco possesses in so high a degree, viz:—it burns well—and without this quality no tobacco, however fine its flavor, is marketable. Whatever other evils it may possess, it has never yet been charged that Wisconsin did not burn well. We have a reputation now gained that will sell our tobacco for years if we are careful to preserve it by improving the varities grown and the methods of handling.

2d. We can grow tobacco here so much cheaper than our eastern competitors, that we can continue to raise the weed in Wisconsin at a profit when they have been frozen out of the business and retired. We have great confidence that Wisconsin is destined to become the largest tobacco growing state in the union. When we have crowded out the East, we can double and trible our product without any danger of over production. Already the Conn. Valley farmers talk of retiring because of slow sale and unprofitable prices.

3d. The secrets of successful tobacco growing cannot be transmitted by word or mouth like those of the Masonic or Odd Fellow order; they must be learned by actual experience and often by expensive experiments. The shiftless, lazy or careless farmer need not expect to become a successful tobacco raiser for he will make a miserable failure of it if he tries. It needs brains, it needs untiring energy and activity, and above all it needs men who can adapt themselves to circumstances and learn and profit by experience; men who read and keep posted on markets and information pertaining to their business to make tobacco growing profitable farming.

4th. History shows that many who start in at tobaco growing make a failure, become disgusted and fall out by the wayside. In 1881, prices were high; farmers everywhere caught the craze and the following season there was an increase of nearly 3000 acres in the state. The season of '82 proved a partial failure, and the crop of '83 was less than that of '81. The high prices of '83 when sales were made at 25 cents per lb. caused a relapse of the craze, so to speak, and again last season the acreage increased nearly 4000 acres. We believe that the crop of '85 will show a further increase of over 5000 acres. So that it will be seen that a partial failure or low prices act as a sort of check upon an over production. In ten years the tobacco section of the state has hardly extended beyond a strip of country 40 miles across. It will take another ten years before tobacco can become a general farm product.

5th. New beginners have no reason to expect they will receive as satisfactory prices as the old and more experienced grower who has attained a reputation by years of hard labor. It is the skill and painstaking effort of the grower that tells when the crop is marketed. The wide varation of prices is oftener due to the difference of men in handling them than any other reason. Buyers tell us that surely over 10 per cent. of the tobacco is ruined by careless or ignorant handling, even in the old districts. What the reputation of our state needs more than an increase in the number of growers is men who will bestow more care, time and attention to perfecting the methods they now put into practice. It can truly be said that tobacco culture is one of the fine arts of agriculture and patience, perseverence and care are the three graces which lead to success.

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